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ABSTRACT

Thirteen learning modules are included in this competency-based secondary education course syllabus, which was adapted from an elementary education course syllabus developed at the College of Education of the University of Toledo for the U.S. Office of Education. Each of the modules contains its title/topic, prerequisite modules, rationale for the module, objectives of the module, the instructional procedures and/or materials, and the assessment instruments for the module. Topics treated by the 13 modules include a) an overview of classroom learning and instruction, b) instructional strategies, c) teaching for inquiry, d) the acquisition of questioning skills, e) instructional simulation games, f) behavior modification in the classroom, g) operation of audiovisual equipment, h) field work and field trips in science courses, i) comparison of text materials, and j) evaluation in mathematics. (See related documents: SP 007 693, 007 700, and 007 706.) (HMD)

ED 087720

SECONDARY EDUCATION
314- 340

MODULES 8-16

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SP007 699

Department: Secondary Education

Course: 340

Title: An overview of Classroom Learning and Instruction (Mini-module #1)

Prerequisite: none

Rationale: When a teacher operates in the classroom, he will find it necessary to utilize a variety of techniques and strategies which will facilitate student learning of the course objectives. It is therefore important that a student be able to implement various instructional behaviors as well as demonstrate some understanding of the benefits and disadvantages associated with each technique. This module and the associated activities is designed to assist the student in recognizing and in implementing four different instructional strategies. Readings and activities will be directed in such a way as to assist students to understand the implications of various instructional behaviors employed in the classroom. Students will see demonstrations of various strategies and have the opportunity to practice implementation both in mini-lessons and in the schools as they proceed through the three module sequence on Instructional Strategies.

Objectives: (These objectives are enabling objectives for the TPO in the three module series).

Looking at two views of classroom learning and instruction: reception vs. inquiry-discovery.

EO 1. Given class presentations and discussion of Flanders Interaction Analysis System (see MEO_1), the student will describe four instructional strategies in a paragraph. The descriptions will focus on both student and teacher role behaviors. Wherever possible the student will use the categories in Flanders' System to describe the instructional strategies.

EO 2. Given a reading on two views of classroom learning, the student will be able to list three assumptions which a teacher makes when he plans to use the following instructional forms in his classroom: discovery-inquiry learning and reception learning.

EO 3. Given the following instructional strategies: mediated instruction, lecture recitation, guided discussion, and inquiry-discovery, and a topic in your subject matter concentration, the student will write one performance objective and describe one classroom activity which would be likely to appear in the lesson plan of a teacher using each strategy.

Instructional Procedures and Materials:

1. Read "Two Views of Classroom Learning" and "The Role of the Teacher in Classroom Interaction" in The Instruction Process by Bryce Hudgins. (See your instructor for a reserve copy of this reading.)

2. Form a group of your classmates and discuss the following questions:
   a. How does a teacher know when to use inquiry teaching?
   b. Under what circumstances is a teacher wise to select a reception learning strategy?
   c. What kinds of instructional behaviors might one expect to see in a classroom which "individualized instruction"?
   d. What kinds of objectives can I help students obtain as I use the following strategies: mediated instruction, lecture, recitation, guided-discussion, inquiry-discovery?

3. Watch classroom demonstrations and participate in small group discussions.

4. Contact your instructor to arrange a time to complete a mini-lesson with peers.

5. Read: Encounters with Teaching by T.B. Gregory (Prentice-Hall, 1972). (See your instructor to borrow a copy.)

6. Discuss the following questions with your classmates and methods instructors:

   These questions are to guide your reading or to facilitate group discussion. They need not be formally answered and submitted to the instructor.
   a. What is meant by "reception learning"?
   b. What is meant by "discovery-inquiry learning"?
   c. What kinds of learning activities might be expected to accompany each of the above types of learning? What would students and teachers be doing in each case?
   d. Optional Activity: Select a unit of content in your subject matter field (such as a chapter from a recent popular textbook) and identify at least one specific example of the learning tasks which you might assign if your goal were to develop a "reception learning" environment. If your goal were to establish an "inquiry-discovery" learning environment?
   e. What are the key assumptions upon which "reception learning" is based?
   f. What are the key assumptions upon which "discovery-inquiry" learning is based?
   g. Which of these learning styles appears most compatible with the traditional instructional goals usually associated with your subject matter speciality? Why?

h. In recent years discovery-inquiry learning has been strongly urged upon teachers in all subject matter fields. Why do you believe this has been the case? Can you see any important limitations associated with teaching toward "discovery-inquiry" learning?

i. Do you see any possible relationship between the two general views of classroom learning? Is there any way in which the enterprizing teacher may utilize both styles to pursue a single objective? Explain.

Assessment: See your instructor for a pre-assessment device for all three modules in the Instructional Strategies Sequence.

Department: Secondary Education

Course: 340

Title: Instructional Strategies

Prerequisites: None

Rationale: The selection of appropriate instructional strategies to match particular performance objectives in the curriculum as well as to meet the individual needs and interests of pupils is one of the most important skills a teacher can develop. In addition, it is equally important to be able to implement a particular strategy into the classroom so that productive learning results. This module on instructional strategies is composed of 3 mini-modules:

(1) An Overview of Classroom Learning and Instruction
(2) Teaching for Inquiry
(3) The Acquisition of Questionning Skills

Students should complete each module. These modules will help a student develop the following skills:

(1) Selecting and implementing four different instructional strategies
(2) Using various instructional strategies to develop an "Inquiry Unit"
(3) Using questionning skills to develop varying instructional strategies as part of as "Inquiry Unit"

Each module has separate objectives believed to be "enabling objectives" for the TPO which is reproduced in this unit. Students are expected to complete or test-out of each of the three "mimi-modules" before attempting the Instructional Strategies TPO.

Materials: The materials which may be utilized to complete the package objectives are located in the Carver Curriculum Materials Center. Reading materials may circulate on an overnight basis. Audiovisual materials must be utilized on a "Room Use Only" basis.

Instructional Procedures: The classroom activities will be divided into two kinds of opportunities. Large group presentations and demonstrations will be conducted utilizing the entire 340 student body and instructional staff. These presentations will focus upon items of a general nature which are a concern of all teachers whatever their subject matter specialization may be. Small group discussions and laboratory exercises will be organized within the four major methods areas. Most students will find both classroom opportunities important in completing the requirements of the module and the general TPO for the 340 course (a field based lesson). It is not intended however, that classroom activities should supplant outside reading and study related to skills and behaviors which must be developed in this module. Both activities are necessary for satisfactory completion of the module. HENCE: HE WHO PROCRASTINATES MAY BE UP THE WELL-KNOWN CREEK WITHOUT A PADDLE!

Terminal Performance Objective: (For 3 modules in Instructional Strategy Sequence)

1. Given a selected topic, idea or series of relationships, the student will present a 15 minute mini-lesson in which he initiates an inquiry-discovery unit. He will utilize behaviors which are conducive to inquiry learning. This will be accomplished by completing the following tasks and demonstrating the indicated behaviors:

   a. Present the instructor with a detailed lesson plan for three to five class days in which the student plans to exhibit three of the following five instructional strategies: inquiry, individualized instruction, guided discussion, mediated instruction, and lecture-recitation.
   b. Exhibits teaching behaviors the majority of which would be categorized as "Indirect Influence" on the Flanders' System. (Lecturing will be kept at a minimum and no behaviors which may be coded as "Giving Directions" or "Criticizing" will be exhibited.)
   c. Asks questions which stress high cognitive operations, i.e., questions which may be categorized as convergent thinking, divergent thinking, evaluative thinking, and probing or value-clarifying questions.
   d. Lists three springboards which may be used to initiate inquiry learning on the topic chosen. (If the springboard is commercially available, the student will provide full bibliographic data.)
   e. Lists and describes two data sources which students will be using during the unit.
   f. Lists ten questions which the teacher expects to ask in order to promote inquiry learning and thinking in the class. The questions will be coded as to the cognitive operation which the teacher expects to promote by asking them.
   g. Lists two hypotheses which students might be expected to generate in the lesson.

Enabling Objectives: These objectives are the objectives associated with each "mini-modules":

1) An Overview of Classroom Learning and Instruction
2) Teaching for Inquiry
3) The Acquisition of Questionning Skills.

Instructional Procedures: See "mini-modules."

Assessment: See your course instructor for pretests for each "mini-module."

Department: Secondary Education

Course: 340

Title: Teaching for Inquiry

Prerequisites: An Overview of Classroom Learning and Instruction. (Mini-module #1 of Instructional Strategies sequence)

Rationale: Teaching for inquiry is a common goal which usually transcends most subject matter areas. Part of the reason for this is our committment to developing learners who are able to think critically, respond to new learning situations, and search for truth and understanding among the milieu of events around them. These skills become increasingly critical for students who are expected to live in and accomodate a world of flux and massive technological and social changes where new knowledge is generated and made obsolete daily. Learners who have been trained in using inquiry skills will hopefully make the adjustment necessary to live in this kind of future work with less difficulty than others.

Such a goal then, requires teachers who are skilled in planning and organizing a teaching-learning environment which facilitates development of inquiry skills and behaviors as the child learns specific concepts and content.

This module will assist teachers to develop and implement lesson plans which will encourage the growth of inquiry skills in each learner. The student will learn the following things:

1) how to demonstrate and implement inquiry oriented lessons.
2) how to distinguish among concepts, facts, generalizations and value positions.
3) how to teach concepts using inquiry skills.
4) how to use "springboards" to kick off an inquiry lesson.
5) how to select and utilize "data sources" to develop inquiry learning behaviors.
6) how to utilize all instructional strategies as part of an inquiry unit.

Objectives: (The objectives are "enabling objectives" for the "Terminal Performance Objectives" found in the general Instructional Strategies module.)

1. Given at least three models of inquiry, the student will select one model and explain each step in the process. He will refer both to teacher and student behaviors and cite specific examples of these behaviors where possible.
2. Given several statements (15-25) which include facts, generalizations, concepts, and value positions, the student will be able to classify each item as to its type. This will be done with 90% accuracy.
3. Given an example of a springboard, the student will state in his own words, a definition of this concept as it relates to inquiry teaching. The student will suggest two examples of springboards which might be used to teach an inquiry lesson in his subject matter area.

4. Given a list of possible topics for inquiry in various subject matter fields, the student will select one topic and identify and discuss at least five materials, activities, or media selections that could be employed as springboards for student inquiry. (This may be pursued as a classroom activity.)

5. Given a list of topics chosen from various subject matter fields, the student will select one topic and locate two different data sources which he would plan to utilize in teaching an inquiry lesson on the topic. The student will be able to describe how that data would be utilized in the lesson. (This may be pursued as a class activity.) Data sources will be judged as to their accessibility, appropriateness as to student ability levels and as to their motivational potential.

Important Principles to be Learned and Applied in Practice:

Teaching for Inquiry Learning

1. There are a wide variety of inquiry models which can be used to describe problem solving or reflective thinking.

2. Inquiry depends upon rational processes and the search for, analysis of, and utilization of a wide variety of data sources.

3. The nature of knowledge and the rapid growth of knowledge suggests that the recall of facts is only a minute part of "knowing" and "doing."

4. Those people who ask questions that they think they have the "correct answers" for, are not engaging in inquiry.

5. Carefully defining the problem in a situation is often omitted, very hard to do, and a necessary step to effective inquiry.

On Developing and Using "Springboards," "Vehicles," and "Motivators":

1. Springboards focus student attention and lead to the exploration of a wide variety of alternatives.

2. Springboards initiate and sustain student inquiry, valuing and feeling.

3. A wide variety of materials and activities can be used for springboards and "discovery episodes."

4. Both students and teacher can collect or create springboards for inquiry.

5. Inquiry learning is usually started by confronting students with some type of activity which is puzzling, emotionally charged and/or involving.

6. Inquiry involves inductive and deductive learning experiences.

7. Subject matter and relevant data are essential to effective inquiry.

8. Teachers need to encourage and reward students for creative thinking, inquiry, valuing and feeling.

9. Teachers must be models of inquiry processes and attitudes for students.

10. Using student ideas is an excellent way to reward inquiry and thinking.

11. Inquiry does not involve closure at the end of each and every class period.

12. Inquiry often involves a wide variety of data (e.g., charts, stories, poems, pictures) from a multitude of disciplines (e.g., biology, ecology, history, government).

Learning Procedures and Materials: Materials which are applicable to all subject matter disciplines and the development of inquiry processes are difficult to locate. While most disciplines urge the "inquiry" strategy upon their practicioners, social studies and science appear to be the two disciplines in which most of the research and writing about the development of inquiry processes have occurred. As a result, most of the materials cited in this section of the module may refer to examples in either of these fields rather than in language arts or mathematics. Students who experience difficulty in recognizing how this relates to their particular fields should challenge the instructor to explain.

Suggested materials and activities:

1. Strasser, BB et. al. Teaching Toward Inquiry. Washington, D.C. National Education Association, 1971.

   This book is one of the very few texts devoted to this topic which is not related to a particular subject matter discipline. This book is good especially in defining the student and teacher roles associated with inquiry teaching and learning. It also presents a nice contrast between inquiry teaching and two other modes of instruction.

2. Massialas, B.G., and Zeven, J. Creative Encounters in the Classroom. New York: John Wiley and Sons, 1967. Chapters 1 & 5.

   This is another text which treats inquiry without reflecting an entirely social studies bias. This is somewhat surprising since both of the authors are prolific writers in that area. Chapter One "The Process and Context of Inquiry" should prove especially helpful to the non-social science methods student.

Another benefit of this book is that inquiry is related to several classic views of thinking, i.e., Dewey, Guilford, Russel. Inquiry is not viewed entirely as a collection of cognitive skills or processes being developed in isolation. In this chapter they are related to values and creative thinking.

3. Massialas, B.G. and Zevin, J. "Inquiry." Today's Education (May 1969) 40-44.

   This article would primarily interest social studies majors. The authors discuss the role of a teacher in an inquiry lesson and give an example of an inquiry lesson which any social studies teacher could present to try his hand at inquiry.

4. Massialas, B.G. and Cox, C.B. Inquiry in Social Studies. New York: McGraw-Hill, 1966. pp. 115-121.

   This section presents and discusses "The Reflective Model"--one method of viewing conceptually the inquiry proce

5. Dewey, John. How We Think: A Statement of the Relation of Reflective Thinking to the Educative Process. Boston: D.C. Heath, 1933.

   This paper summarizes Dewey's discussion of the five phases of thinking. It is an example of another conceptual model of the inquiry process.

6. Tanck, M.L. "Teaching Concepts, Generalizations and Constructs," in Social Studies Curriculum Development: Problems and Prospects, edited by D.M. Fraser. Washington, D.C.: National Council for the Social Studies, 1970.

   This reading would be helpful to someone experiencing difficulty in meeting objective EO 3.4. The treatment of social studies in this chapter is rather minimal.

7. Other selected books which may help:
   a. Beyer. Barry K. Inquiry in the Social Studies Classroom. Columbus: Charles E. Merrill, 1971.
   b. Mallan, J.T. and Hersh, R.H. No G.O.D.s in the Classroom: Inquiry into Inquiry. Philadelphia: E.B. Saunders, 1972.
   c. Mallan, J.T. and Hersh, R.H. No G.O.D.s in the Classroom: Inquiry and Secondary Social Studies. Philadelphia: W.B. Saunders, 1972.
   d. Zahoric, J.A. and Brubaker, D.L. Toward More Humanistic Instruction. Dubuque, Iowa: W.C. Brown Company, 1971.

8. Class demonstrations will include sample lessons, treatment of media, various instructional strategies and their relationship to an inquiry unit, question development for inquiry, and inquiry in methods' areas.

(It is important to note that many instructor handouts and sample materials will accompany classwork on this topic.)

9. Morine, H. and Morine, G. Discovery: A Challenge to Teachers. Englewood Cliffs, N.J.: Prentice-Hall, 1973.

This interesting book gives both very readable theory and numerous practical examples of using discovery-inquiry teaching strategies. It should prove of particular value to a teacher in a structured discipline such as science or mathematics.

Assessment: See your instructor for pre- and post-assessment devices for all three "mini-modules" in the Instructional Strategies sequence.

Department: Secondary Education

Course: 340

Title: The Acquisition of Questioning Skills

INTRODUCTION

This package is designed to provide the user with the opportunity to develop and refine his skill in asking questions as a part of his instructional behavior as a teacher. It has been organized in such a manner that the student may formulate his own program of educational activities and experiences according to his entering behavior vis-a-vis the criterion performance required by the specific objectives and competencies. For most objectives there are a variety of means (i.e., learning media and experiences) by which the pre-service teacher may strive to attain the specified criterion performance level. As a result the package has been constructed in such a way that the user may determine his own point of entry, select his own program of learning experiences, and decide when he is ready for the posttest for a particular objective. In a sense then, the learning package is partially a bibliography of suggested learning experiences and activities, some combination of which should enable the user to reach the specified criterion performance levels required in the objectives.

This learning package contains the following component parts:

1. Rationale: an explanation of why the objectives are important.

2. Overview: a statement of general directions which explain how the package may be most efficiently utilized.

3. Objectives and Competencies: a list of behavioral objectives which describe the professional competencies which the learner will demonstrate by completion of the package.

4. Important Principles to be Learned: a list of the key ideas relating to questioning skills which will be stressed in the readings and learning experiences planned within the package.

5. Sequential Outline of Content and Suggested Learning Activities and Materials for Meeting the Objectives.

6. List of Tasks: a list of optional, specially recommended, learning tasks which should help the learner develop general competency in asking questions.

7. Suggestions for Further Practice: these tasks are identified for the learner who has experienced some difficulty in meeting the objectives. While these tasks are optional, they may be strongly suggested to the student in need of remediation.

8. Master List of Materials and Learning Experiences: a list of all suggested means which have been identified to assist the student in developing the specified competencies in question-asking skills. This list also provides a record of those means utilized by the learner to pass the objectives. The list is to be submitted upon the completion of the learning package.

GENERAL INSTRUCTIONS FOR USING THE SELF-DIRECTED LEARNING PACKAGE

Using a learning package provides the student and the teacher with one opportunity to experience individualized instruction. While the objectives for the unit of study have been predetermined, the pace of learning, the time of learning, and the selection of appropriate learning materials and experiences has been left to the student. To this end the student has been provided with autonomy for being responsible for planning his own learning experience to attain the required performance levels. The learner is free to organize those learning experiences which may be congruent with his individual cognitive style or which may be most appropriate given his individual entering behavior.

Materials suggested in this unit have been placed in the Curriculum Materials Center. They are available to be signed out for three day periods. The audio-visual materials must be used in the CMC, but all software is free to circulate. Material should be returned promptly in order that others may use them. Students are asked to keep a record of those materials and experiences which they select and utilize to meet the performance objectives. A record sheet for identifying the educational means used and the approximate time used is provided as the last page of the module. At the completion of the module this sheet will be submitted to the course instructor.

Rationale: One of the most important elements of inquiry teaching is the use of clear, appropriate, well-timed questions that encourage students to explore important ideas, information, value conflicts, data, and human feelings. Inquiry questions ask students to go beyond the given facts and information of a lesson and ask them to think, develop personal meanings, analyze their own values and feelings, offer value positions and judgements, actively participate in learning and create new ideas.

Many of the new curriculum materials include innovative and valuable sources of data, interest and student involvement. Too often, however, the questions asked of the students by the teacher, the "Chapter Reviews" assigned as homework, and the tests developed are aimed only at the low levels of cognition--recall and recognition. Most often, student materials and activities do not encourage students to inquire individually into value systems, feelings, emotions, and areas of controversy. "There is one factor that is so often lacking in the self-discovery method, i.e., self-discovery."[1]

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[1] R. M. Jones, Fantasy and Feeling in Education (New York: Harper and Row, 1970).

Since the role of the inquiry teacher is to initiate, encourage, reward and facilitate student inquiry, he has to be able to pose questions and redirect student questions in the direction of active learner participation in thinking, valuing, and feeling. "Teachers know that the proofs of well composed and conducted lessons are more often found in questions raised rather than in the answers given."[2]

Inquiry questions lead to inquiry activities on the part of the student. A positive climate for inquiry encourages students to do most of the questioning as well as most of the responding. The teacher is a "fellow participant" and a stimulator, not a G.O.D. (Giver of Directions) of a fountain of knowledge and opinion.

Overview: During this unit developed to improve your questioning skills the student has been assigned a major responsibility for identifying the kinds of learning experiences he believes to be most productive to enable him to reach the criterion performance level on the stated objectives. While the package is designed to be self-instructional so that a student might be able to develop the expected competencies outside regular classroom instruction as he uses the suggested resources, it is not intended that this must be an independent learning experience. In addition to the reading materials suggested in the package, the student will also notice audio (casette) tapes, a filmstrip, and movies or videotapes for his use. These learning materials may be used independently or among a small group of students. Beyond this the student has two additional resources at his disposal to assist him in developing the expected competencies. First of all, the student may see his instructor individually for assistance with a particular learning problem. A second possibility is provided by specially scheduled classroom activities. This time will be reserved for group-oriented learning opportunities. The following kinds of opportunities will be developed during scheduled class time:

1. Group discussions on the possible uses of teacher questions.
2. Observation, coding and analysis of teacher questioning behaviors in demonstration lessons recorded on typescripts, movies, videotapes and microlessons.
3. Laboratory work in writing more effective questions for classroom use evaluation.
4. "Questioneze," (a simulation game).
5. Microlessons with peer groups.

A separate schedule of times, room assignments and specific activities will be distributed each time this module is used.

After the student has decided that he is able to meet the expected competency identified in any objecitve, he is encouraged to submit his posttest for instructor evaluation and feedback.

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[2] Ibid., p. 195.

Terminal Performance Objective: Given a list of four social studies concepts, the pre-service teacher will present a micro-lesson teaching the concept within a period of ten to fifteen minutes using almost exclusively the asking of questions. Acceptable performance shall require:

1. The use of each of the following types of questions at least once--cognitive-memory, convergent thinking, divergent thinking, evaluative thinking.
2. Question sequence to cause student responses to progress smoothly from one cognitive level to another rather than jumping around.
3. Questions phrased so those being taught do not request that the question be repeated or rephrased.
4. Response pattern to questions being well distributed among the learners.
5. The lesson develops according to the lesson plan submitted in advance by the pre-service teacher.*

*(This TPO may be met as one completes the TPO for the three packages which comprise the Instructional Strategies Sequence.)

Enabling Objectives:

EO1. Given a list of instructional questions, the preservice teacher will be able to classify these questions according to the following kinds of thinking which are required of the student: cognitive-memory, convergent thinking, divergent thinking, evaluative thinking, and value clarifying or affective thinking. (85%)

EO2. Given one or more questions in a specified mode of thinking, the pre-service teacher will be able to rewrite a similar or related question using the other four modes of thinking. (85%)

EO3. Given a list of poorly phrased questions, the pre-service teacher will be able to classify the questions according to the dominant source of their faulty construction. (85%)

EO4. Given a list of poorly phrased questions, the pre-service teacher will be able to rewrite the questions improving upon the phrasing in each case. In addition, the student will be required to specify the nature of the error in each case. (85%)

EO5. Given a topic of his choice and any learning material which he selects from which to teach a brief lesson to secondary students, the pre-service teacher will be able to develop a list of at least 12 questions which he would ask to develop the topic or concept. Each of the following categories of thinking are expected to be represented in the list of questions: cognitive-memory, convergent thinking, divergent thinking, evaluative thinking and valuing or affective thinking. (85%)

E06. Given selected readings the pre-service teacher will be able to list and briefly explain eight (8) different uses of questioning strategies in the classroom. At least seven uses are required to meet criterion performance level.

Instructional Procedures and Materials:

Important Principles to be Applied in Practice

1. Questioning behavior is one of the most important teacher behaviors.

2. Questions are prescriptions of tasks to be performed by respondents.

3. Questions may be used to lead the student step-by-step to think about his experience.

4. Questions can be used to sample respondents' understanding of, or ability to make application of, concepts.

5. There is a system which classifies questions into four categories:

    a. Recall: narrow questions calling for facts or other recall items and involving rote memory. They are at the lowest intellectual level. (Example: What is the name of the mountain range separating Europe and Asia in the north?)

    b. Convergent: higher-than lowest level questions calling for the analysis and integration of given or remembered data. Problem-solving and reasoning are often involved in this category. The answers involved may be predictable but the task requires application of two or more recall items. (Example: What in the location of these mountains accounts for their importance?)

    c. Divergent: questions that call for answers which are creative and imaginative and not empirically provable. Many different answers may be correct, and therefore, acceptable. (Example: How might the lives of the people in Russian and the Baltic countries be different if the mountains were not there?)

    d. Value: Questions that deal with matters of value judgments and choice. These call for an opinion. (Example: Which country would you prefer to live in? Why?)

6. Questions may be classified as either broad or narrow.

   a. Narrow questions are those that place limiting restrictions on the respondent within the type of behavior called for. For example, "What are the three steps..." The word "three" makes this question a narrow question.

   b. Broad questions are those which do not restrict the student's answers even with recall questions. An example would be, "What are the steps..." The question does not help the respondent "avoid" an incorrect response.

7. Questions that can be answered by "yes" or "no" are nearly always recall questions.

8. The behavior of the teacher when asking questions should not follow a pattern readily and easily predictable by the respondents.

9. Questions stated to the group tend to cause all learners to prepare to respond.

10. Questions stated to a single person tend to cause other respondents to not prepare to respond.

11. Since questions are task prescriptions, pauses to allow respondents to gather and synthesize the data required to fill the prescription should be provided.

12. Reinforcement of a response will tend to encourage the respondent to get involved more.

13. Redirecting of questions is a means of involving more than one respondent in fulfilling the task prescribed by a question.

14. Redirecting of questions is most effective when immediate reinforcement is withheld from the first person to respond to a question. However, reinforcement should eventually be given.

15. Temporarily withholding reinforcement, combined with redirecting questions, can help involve more respondents with the task prescribed by a question.

16. Rewording of questions is the practice of restating a question differently than it was phrased when first stated.

17. Rewording of questions is a pattern to be avoided for four reasons:

    a. It does not condition the person asking questions to formulate good questions the first time.

    b. It tends to promote the asking of multiple questions.

c. Too often the last question posed prescribes a lower level of cognitive or intellectual performance. All too often it prescribes recall behavior.

d. It tends to encourage the person asking the questions to end up answering them, too.

18. Multiple questions are a series of questions posing several related tasks so closely phrased that the respondent does not know whether or not he is to respond to one or all of them.

19. Multiple questions is a question-asking pattern to be avoided.

20. Leading and cueing is the behavior of helping the respondent get a correct answer by responding to cues given by the person asking the question rather than by the respondent performing the task prescribed by the question, unassisted.

21. The way in which a question is stated in terms of the tone of voice, inflection, and stress, can provide leading and cueing to a respondent.

22. Leading and cueing is a question asking pattern to be avoided, unless it is a premeditated behavior intended to provide reinforcement to a reluctant respondent.[3]

23. Inquiry questions are open-ended and never call for a single correct response.

24. Questions leading to hypotheses and generalizations are stated in the present tense and do not relate to only one time, place or person (e.g., Why do men migrate? rather than Why did William Penn come to America?).

25. Questions leading to student value positions and judgments ask students to state what should or ought to be and what is best, good or worthwhile (or worst, bad or worthless).

26. Probing questions are essential to effective inquiry. They ask students to explain their own ideas, positions, opinions, and hypotheses and give good reasons for them.

27. Questions asking about student experiences, values, feelings, emotions and creative ideas are important in inquiry.

28. Inquiry teachers attempt to decrease the time they spend talking and asking questions and increase the time students are discussing, asking questions, giving evidence, collecting information and actively participating in a variety of activities.

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[3] Baird, J. H.

29. Students in an effective inquiry classroom automatically give evidence for their positions and ask other students to do so.

30. Inquiry questions ask students to go beyond the immediate data and include other examples, personal experiences, creative ideas, speculations, value judgments, other sources of information, personal meaning, feelings and values, predictions, explanations, evidence and other relevant contributions.

OUTLINE OF CONTENT AND SUGGESTED LEARNING ACTIVITIES

The Importance of Questioning Skill As a Professional Competency.

A. Reading #5 - "Why is questioning so vital?" - discusses the importance and uses of questioning behavior. Relates questioning to thinking and introduces Bloom's cognitive hierarchy and its relationship to the development of questions which stimulate high level cognition in the student. Useful little chapter.

OBJECTIVES
TPO
EO6

B. Audiotape lecture #2 - "The importance and Uses of Questions as an instructional tool" - Oral presentation of key ideas in Reading #5; does not emphasize Bloom's hierarchy.

C. Reading #6 - pages 83-86. Brief overview and introduction to the importance of questioning.

D. Class lecture-discussion on the importance of questioning.

Uses of Questioning Skills.

A. Audiotape lecture #3 - "Systematic Use of Questions" - Oral presentation of the importance of systematically planning questions in order to reach a cognitive objective.

OBJECTIVE
TPO
EO5

B. Reading #3 - "The Systematic Use of Questions in Teaching-Learning" - Useful reading which explains how one plans for questioning to stimulate thinking by using Bloom's cognitive hierarchy. A good explanation of the differences between questions found at each cognitive level. Good short reading which may help one to develop questions at each cognitive level.

B.1 Study Guide Questions to accompany Reading #3. In the appendix of learning package.

C. Lecture and discussion about uses of questioning in the classroom.

Classifying Questions According to Type.

A. Reading #6 - "Developing Question-asking Skills" - pages 85-106. Excellent reading which introduces Guilford's model for categorizing questions. Includes useful explanations, examples and several check up tests.

OBJECTIVES
TPO
E01
E02

B. Reading #7 - Classroom Questions - Book which discusses Bloom's model for categorizing and writing questions. Has a separate chapter for each cognitive level. Good examples. For the interested student who wishes to look at this behavior in a more comprehensive treatment.

C. Reading #2 - "How to Ask Questions" - Suggests how questions may be classified according to several systems. Brief, superficial.

D. Reading #8 - "The Question: What to Ask" - Excellent little reading which suggests that the practical categories used by Smith and Meux in the book, A Study of the Logic of Teaching, be used to classify questions. Interesting reading -may be more intuitive for student than Bloom's categories.

E. Reading #11 - "Levels of Questioning" - An excellent programmed treatment of writing questions at different levels. This would be especially useful to the student who is experiencing difficulty with other materials and is in need of remedial help.

F. Reading #12 - This reading describes the categories identified and utilized by Massialas and his associates in the Michigan Category System. This treatment is somewhat different from other systems in that it attempts to deal with the affective, value-oriented questions which are so critical to effective social science inquiry training.

G. Class - A lab period in which students practice analyzing the "suggested" questions in various social studies curricular materials. Students will have opportunities to use and interpret the various systems which have proven effective in categorizing questions.

H. Practice your ability to recognize types of questions using typescripts, audiotapes of lessons and films of lessons. Try using both Bloom's categories and those of Guilford with each of these media forms:

Typescript 12
Typescript 11
Typescript 8
Typescript 7
Audiotape lesson 6
Audiotape lesson 5
Films: See instructor to obtain access to films of classrooms. Compare your evidence with the general paragraph summaries of the questioning exhibited in the films and audiotapes. Coded (Bloom) copies of typescripts will be on file in CMC.

Effective Questioning Behavior

A. Reading #1 - "The Art of Questioning" - Practical explanation of appropriate behavior in question. Good treatment of the characteristics of proper questioning and effective question forms. (pages 38-45)

OBJECTIVE
TPO
E03
E04

A.1 Study guide questions to accompany use of reading #1 - appendix to learning package.

B. Reading #10 - "120 Questio[redacted]ut Your Questioning Technique" - Suggested for study to gai ghts by implication of desirable questioning form

C. Reading #2 - "How to Ask Questions" - (pages 4-6) - A good, short explanation of guidelines for good questioning.

D. Filmstrip #1 - "Asking Questions" - Good overview of questioning behavior and how to use questions to best advantage.

E. Class - Analysis of questioning using a live demonstration or a movie or a videotape.

Pitfalls of Questioning.

A. Reading #[illegible] - "Developing Question-asking Skills" - (pages 107-119) Stresses phrasing errors and includes numerous examples and check-up self tests.

OBJECTIVES
TPO
E03
E04

B. Reading #1 - "The Art of Questioning" - (pages 45-52) - Good, short explanation of some of the most common pitfalls in questioning behavior.

B.1 Handout to accompany reading #1 - appendix.

C. Reading #2 - "How to Ask Questions" - (pages 6-7)

C.1 Handout to accompany reading #2 - appendix.

D. Reading #9 - "Questioning" - Rather superficial discussion, but does make several suggestions for practices to avoid.

E. Audiotape lecture #4 - "Pitfalls of improper questioning" - Oral synthesis of readings in this area.

F. Class - A laboratory session in improving poorly written questions.

Strategies for Question-asking.

A. Reading #6 - "Developing Question-asking Skills" - Excellent presentation and discussion of appropriate strategies for improving the power of your questions. Good examples -useful check-up self tests.

OBJECTIVE
TPO

B. Reading #10 - "120 Questions About Your Questioning Technique" - If you haven't read this earlier, it is useful as a tool to suggest how your questions should be used.

C. Class time - "Questioneze" and/or microlessons with peer groups.

D. Class discussion on the uses of questioning behavior within the key modes of instruction.

Developing Questions

A. Reading #4 - "How to Write Questions in the Cognitive Domain - How to Write Questions in the Affective Domain" - This may be a useful reading to help polish your ability to recognize and develop questions according to Bloom's levels of cognition. Suggest that this be skimmed.

B. Select a social studies concept and see if you can develop a good question at each level of cognition in the hierarchy and for each mode of Guilford's model. Exchange these with another student and critique one another's efforts. Have your instructor provide feedback if a fellow student is unavailable.

C. Organize a group of fellow students and teach a mini-lesson for a particular concept. Use questions almost exclusively. Reocrd an audiotape. Discuss the use and nature of your questions within the group. (See your instructor to arrange for a tape recorder.)

D. Class discussion and demonstration of using questions for value clarification.

E. Class discussion of "Study Questions for Readings" which accompany Task One.

SUGGESTED TASKS

The following readings are important to the completion of the tasks below and the demonstration of the competencies in this section of the module. The learner should also view the video-tape(s) of inquiry teaching (see task 2). Use the study questions on the following page.

Inquiry in Social Studies, Chapter 5.

Toward More Humanistic Instruction, Chapters 1, 2 and 3.

Creative Encounters, Chapters 1-5.

After reading the selections above,

1. The learner should obtain published materials in his teaching field. Some materials that are "inquiry oriented" and some that are not "inquiry oriented" should be selected. The

teacher should then make two lists of questions taken from the chosen materials. One list should include at least ten examples of inquiry questions containing one example of each of the different types of inquiry questions and labelled as either defining, hypothesizing, normative, probing, etc. The second list should include at least ten examples of a variety of non-inquiry questions. Each question should be labelled by the type of response the teacher expects from the student (e.g., recall a fact, recognize an important date in history). Note: Inquiry oriented sources might include World History Through Inquiry, Concepts and Values, Social Studies Through Inquiry, The People Make a Nation.

STUDY QUESTIONS FOR READINGS

1. What do people mean when they refer to inquiry?
2. What types of behaviors are the students demonstrating during inquiry?
3. What types of behaviors does an inquiry teacher demonstrate?
4. What are inquiry questions?
5. What are the differences between inquiry oriented and non-inquiry oriented questions?
6. What is the role of the inquiry teacher?
7. What is the place of values, feelings and emotions in an inquiry classroom?
8. What is a hypothesis, generalization, value position and value judgment?
9. What does "grounding" mean?
10. What different types of things can be used as grounds?
11. Who does most of the talking in an inquiry classroom? Why?
12. What questions do you have? Write them below.

2. While viewing one or more of the video-tapes, the learner should analyze the types of questions used in the tape by stating at least 5 specific examples of questions and discussing their purpose in the lesson. This should also be done for at least two of the dialogues in chapters 2, 3 and 4 of Creative Encounters. One of these dialogues should come from chapter 4 and one from either chapter 2 or 3.

Video-tapes for Viewing:

1.

2.

The learner should also examine at least five different dialogues of inquiry classrooms (e.g., video-tapes, written dialogues in Creative Encounters, actual teaching or audio-tapes). What seems to be a "typical" ratio of student and teacher "talk"? Explain your answer. Why might such a ratio be considered an "optimal" ratio?

3. The learner should write a question or set of questions that would lead to hypotheses and value positions similar to the ones stated below; or should make his own list of hypotheses and value positions and develop his own set of questions.

   a. When a political leader's right to rule is threatened, he will use force to maintain his power.

   b. If an organism naturally remains inactive during daylight hours, then its natural activity will be altered by a change of seasons.

   c. If resource consumption and population growth continue to grow exponentially, the demand for those resources will soon exceed the supply.

   d. People should treat other people more fairly.

4. The learner should select a topic of his choice and a short document, song, poem, picture, cartoon or paragraph relevant to that topic. The teacher should then write a set of inquiry oriented questions aimed at the six different areas discussed in the "Information" section.

FOR FURTHER PRACTICE

1. The learner could read some of the supplemental selections below and/or meet with another student or the instructor to view one of the video-tapes which the student hasn't previously seen.

   a. Teaching High School Social Studies, pp. 1-18, 180-183, and 202-237.

   b. Values and Teaching, Chapter 5.

   c. Teaching Public Issues in the High School, Chapter 10.

   d. Inquiry in the Social Studies Classroom, Chapters 3 & 4.

2. Visit a local school and code the questions asked by the teacher. Analyze the lesson in terms of this data. Comment on the teacher's apparent objective, the nature of the teacher's questions, and the nature of the student participation.

3. Select several college tests and evaluate them in terms of one of the questioning analysis systems discussed in the learning package.

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STUDY GUIDE QUESTIONS AND SUGGESTED ACTIVITIES

Reading #1

"The Art of Questioning," - A chapter from Handbook for Social Studies Teaching, prepared by the Association of Teachers of Social Studies of the City of New York. New York: Holt, Rinehart & Winston, pp. 38-57.

1. Read pages 38-44. "Characteristics of Good Questioning"
   - a. Write a short paragraph on the nature of questions.
   - b. What are some of the important mechanics involved in proper questioning?
   - c. List and describe using examples five characteristics of good questioning technique.
2. Read pages 43-45. "Effective Question Forms"
   - a. Develop three questions in each of the forms suggested by the author. Compare yours with those created by another student or check with your instructor.
3. Read pages 45-48. "Pitfalls of Questioning"
   - a. What do you see as the most common pitfalls of questioning?
   - b. Which errors do you believe you are likely to be most guilty of in your own teaching.
   - c. If you had trouble with the pretest for objective C, re-examine the questions provided. If you still are unable to understand the error of a particular question, check with the instructor.

4. Read 48-51. This is appropriate for general background in developing questioning ability.

5. See the exhibits of questions developed for different areas of social studies on pages 52-64. While these are questions most appropriate to the secondary level, many are fine examples of carefully constructed and useful questions.

STUDY GUIDE QUESTIONS AND SUGGESTED ACTIVITIES

Reading #2

J. C. Morgan and J. E. Schreider, "How to Ask Questions," How To Do It Series, #24, National Council for the Social Studies, 1969.

This article is useful as a background for asking questions at different cognitive levels and for obtaining guidelines for good questions.

1. What are eight different types of questions suggested by the authors?

2. Try your hand at developing several examples of each type of question and have another student react to your trial effort.

3. Select several questions from the list on pages 52-68 of Reading #1 and see if you can readily recognize what makes each a good question.

4. Using the explanation of the cognitive levels identified by the authors, select several other questions from the list in Reading #1 and see if you can easily determine the cognitive level required by the question. If you experience difficulty doing this, refer to the Reading #3 and/or Reading #4.

STUDY GUIDE QUESTIONS AND SUGGESTED ACTIVITIES

Reading #3

"The Systematic Use of Questions in Teaching-learning," in Evolving Instruction, by E. E. Haddan. New York: Macmillan, 1970.

1. How do questions and a student's thinking relate to one another?

2. Define each of Bloom's categories in your own words so that each category is distinct from the others.

3. Most questions occur at low cognitive levels. Explain at least three weaknesses or limitations of this practice.

4. What kinds of things may a question aimed at the interpretive level require a student to do? Cite at least three.

5. The following question has been developed by one student as an example of an analysis question. Examine it and write a short paragraph explaining why you agree or disagree with his opinion.

   "Which step in the process of electing a President, would you believe the American people know least about?"

6. In an elementary classroom what possible weaknesses may be associated with synthesis and evaluation questions?

7. What are the two steps of evaluation according to Sanders? Explain these steps using the following question as an example:

   "After examining criticism of the electoral college and various proposals for change, which proposed change do you think would be most democratic? Defend your choice."

8. Given the concept "division of labor," develop a short, imaginary classroom dialogue for fourth grade social studies in which this concept is developed for students as you use questions. Use at least one question at each of the cognitive levels. Underline and identify your examples in the dialogue. Code them in the margin.

Assessment: See objectives and then contact the course instructor for a copy of the pre- and post-assessment items.

LIST OF MEDIA AND ACTIVITIES SELECTED

	Time Spent
Reading # 1	
Reading # 2	
Reading # 3	
Reading # 4	
Reading # 5	
Reading # 6	
Reading # 7	
Reading # 8	
Reading # 9	
Reading #10	
Reading #11	
Reading #12	
Filmstrip # 1	
Audiotape Lecture # 2	
Audiotape Lecture # 3	
Audiotape Lecture # 4	
Audiotape Lesson # 5	
Audiotape Lesson # 6	
Typescript # 7	
Typescript # 8	
Typescript #11	
Typescript #12	
Class I.,D	
Class II.,C	
Class III., G	
Class IV.,E	
Class V.,F	
Class VI.,C	
Class VI.,D	
Class VII.,B	
Class VII.,C	
Class VII,D	
Class VII.,E	
Task One	
Task Two	
Task Three	
Task Four	
Further Practice 1	
Further Practice 2	
Further Practice 3	
Study Guide One	
Study Guide Two	
Study Guide Three	
Videotapes	

Name ______________________________

Department: Secondary

Course: 340

Title: Instructional Simulation Games

Overview: Design and development of simulation games to meet specified behavioral objectives.

Prerequisite Module(s): Behavioral Objectives, Mediated Instruction

Terminal Performance Objective: Given a set of gaming materials, a copy of the Game Game, and a copy of "Facilitator's Instructions", each 340 student (teamed with one, two, or three other 340 students in the same major methods area) will be able to develop a simulation game designed to facilitate the players' attainment of a stated behavioral objective. The game must satisfy all rules as stated in the Game Game. The game's structure must meet the classification criteria specified in the "Facilitator's Instructions". The game must be developed within two hours.

Instructional Procedure:

1. View introductory slide/tape (I'm Game: Simulate Me).
2. Peruse module.
3. Participate in simulation game play and classification of games by types of objectives.
4. Develop simulation game to meet specified behavioral objective in major methods area (in teams).

Assessment: See TPO.

GLOSSARY

Simulations and Games

Instructional Games - The essential properties of an instructional game--to discriminate it from a non-instructional game--is that objectives are specified for which the game acts as the media/strategy to shape the learner's behavior. Therefore, if the game assists in the achievement of pre-determined behaviors contributing to the education of the learner, it can be classified as an instructional or academic game.

Gaming - The essential properties of a game are players . . . each striving to achieve a specified goal, and rules which specify the range and nature of legitimate actions by the players and establish the sequence within this action occurs.

Simulation - An operating model, reproduction, or imitation of physical or social phenomena, consisting of a set of interrelated factors or variables which together function in essentially the same manner as the actual (or hypothetical) system.

Role-playing - The practice or experience of "being someone else". It is employed to enable a person to attempt to understand the situation of another person, or it may be a fictitious role in which the player is seeking to acquire an understanding of relationships or actions.

Simulation Game - A model or caricature containing a selective representation of reality (simulation) which utilizes role-playing and a game structure, with rules of play and a method of determining a winner or winners.

Procedure Goal - The objective is that the players learn a process or procedure, or a part thereof.

Product Goal - The objective is that the players build, design, formulate, create, or develop a specified, tangible product.

Fact/Concept Goal - The objective is that the players learn (through rote, drill, association, or memorization) a given set of rules, facts, concepts, or generalizations.

Attitude Development Goal - The objective is that the players feel good, comfortable, relaxed, self-actualized, etc., or that the players undergo a modification in their attitudes or a clarification of values.

THE GAME GAME

OVERVIEW (SCENARIO): This is a game which will enable your team to design and develop an instructional simulation game (a tangible product).

OBJECTIVE: Using the materials provided, each team will develop an instructional simulation game which meets the specifications outlined below.

RULES: Your game must include rules, i.e., Players' Goals, Time Limits, Permissible Behavior, and Winning Criteria.

A. Players' Goals: Your game must meet the following criteria:

1. Have clearly stated instructional objectives (what the learners are to learn, or produce, or feel, or how the learners' behaviors are to change).
2. Be playable by groups of 8-10 players.
3. Not exceed 30 minutes of playing time.

4. Not have longer than a 15 minute debriefing session.

B. Time Limits: Each team has two hours to meet the goal (the finished product--the developed game).

C. Permissible Behavior:

1. You may use only the materials provided to build your game.

2. Your game may include a debriefing session.

3. Your game may include a list of procedures or suggested procedures, i.e., Players' Roles, Playing Process, and Established Sequence of Events.

4. Your game may be geared to any age or grade level and may be applicable to any subject area.

5. You may use any procedure you wish to reach the objective.

D. Criteria for Winning: The winning team will be the team that develops the best game--based on the following criteria as judged by the panel of godparents:

1. The game must follow all rules stated above.

2. The game must facilitate the players' attainment of the stated instructional objective.

3. The game's structure must meet the classification criteria specified in your Facilitator's instructions.

4. In case of ties, subjective consideration will be given to motivational appeal and simplicity.

TOO BAD!*

designed by Madeline A. Cooke

8-10 players
30 min. playing time

Three people should play as squares; five or more should play as circles, depending upon the number of players.

Throw the dice to determine who plays as a square or circle. An even number is a square, an odd number is a circle.

The person who throws the highest number begins.

Each player throws two dice and moves according to the tital which he throws.

Players continue to move around the board until the last player reaches "End."

Players may remain on the space where they land, draw a card and move according to its directions, or throw the dice a second time. Which of these things a player does depends upon whether he is playing as a square or as a circle and also on the design of the space on which he lands.

These plays have been summarized in a sketch on the game board. They are as follows:

1. If a circle lands on a circle, he draws a circle card and moves according to the information on the card.
2. If a circle lands on a square, he waits there until his next turn.
3. If a square lands on a circle, he waits there until his next turn.
4. If a square lands on a square, he draws a square card and moves according to the card.
5. If either a square or a circle lands on a triangle, he gets to throw the dice another time and take a second turn.

*A game designed to bring out feelings of frustration or anger when one realizes that he cannot win. The debriefing questions help the child relate this to contemporary society, where some individuals or groups find it difficult to be successful because the rules are "stacked" against them.

Junior-high school.

OEA Workshop on Simulations and Gaming, Columbus, Ohio, Feb, 2-3, 1973.

TOO BAD!

Debriefing Suggestions

1. Dif you enjoy playing the game? Why or why not?
2. How did you feel when you realized that you were going to be the last one to finish?
3. How could the game be changed in order to make it easier to play as a square?
4. In the real world is it easier for some people to win or be successful than others? Can you name some groups of people who may find it more difficult to be successful than others? or individuals?
5. Can you suggest some ways to change the rules of life or society so that some of these groups have a better chance to be successful?
6. How large a role does chance or luck play in this game? In life?

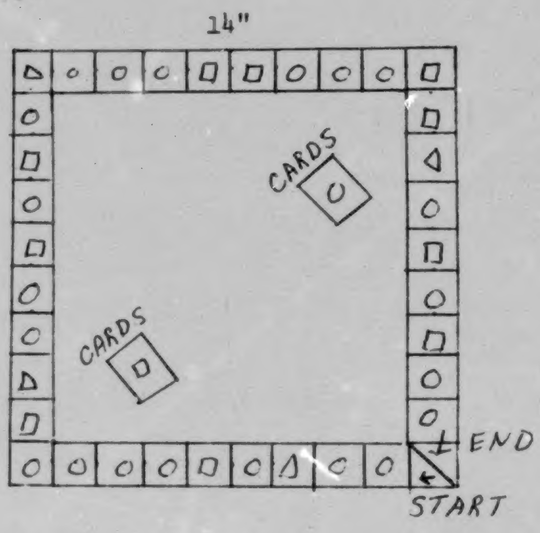
****

The game has been designed to make it easier for the circles to win.

Those playing as circles have more chance of landing on a circle because there are more of them.

The circle cards mostly direct the player to move ahead; the square cards usually direct the player to move back.

Circle cards	Square cards
+3 - 5 cards	-3 - 5 cards
+2 - 4 cards	-2 - 4 cards
+1 - 3 cards	-1 - 3 cards
-3 - 1 cards	+3 - 1 card
-2 - 2 cards	+2 - 2 cards
-1 - 2 cards	+1 - 2 cards
-10 - 2 cards	+10 - 2 cards



Title: Inquiry Game
Developer: Richard Lo and others

Instructional Objectives

1. To develop problem attacking skills -
    a. to observe the problem.
    b. to define the problem.
    c. collect information by listening or asking questions.
    d. to classify information.
    e. to arrive at a hypothesis.
    f. to test the hypothesis.
    g. reevaluate the strategy.
    h. to collect more data through research.
2. To arrive at a reasonable conclusion.
3. To develop leadership skills.

Rules and Procedures

1. Leader responses can be - YES, NO, or DOES NOT APPLY.
2. Players may ask as many questions as they want, then pass.
3. Leader calls on individuals whose hands were raised.
4. Time limit 10 to 15 minutes (flexible to group).
5. Group size 8 to 10 individuals.
6. No communication in group unless called for by leader.
7. Leader may call conference midway through if needed.
8. Leader may not encourage or discourage individuals by tone of answers.

Examples of Problems

1. A truck is stuck under a bridge at an underpass. How can the truck be removed without damaging the bridge?
2. "X" was at the equator. "X" was freezing to death. What is "X"?

3. I only travel towards the South. My brother only travels toward the North. Why?

4. "X" does not grow. No matter how tall you are "X" always looks you in the eye. What is "X"?

Answers

1. Let the air out of the tires and back out the truck.

2. Ice cube.

3. I am at the North Pole. My brother is at the South Pole.

4. Mirror.

Title: The Direction Game
Developer: Callahan and others

Instructional Objectives (Procedural Goal)

1. Students will learn how to give accurate directions.

2. Students will learn how to take directions.

3. Students will improve group work skills.

Rules

1. The group leader must pick up an abstract design.

2. One student in the group is designated as the "artist". (Chosen by the last name beginning with the letter "M", "L", "N", etc.)

3. He may not see the design.

4. Only one person may speak at a time. Each member of the group must give the "artist" a one-sentence direction to help the "artist" duplicate the drawing. Once given, a direction may not be retracted or changed.

5. Succeeding players may change or correct preceding player's directions.

6. The game must be completed in ten or less minutes.

7. Use the rating scale to evaluate your results. (Use about five minutes for this activity.)

8. After using the rating scale, select a new "artist" (last name to begin with the letter closest to the end of the alphabet) and replay the game.

Procedures: The Rating Chart

This chart is designed to help you evaluate and discuss your product and procedure.

	Col-1	Col-2
1. Is your design the same size as the original?	Yes	No
2. Is your design placed on the paper accurately?	Yes	No
3. Is your design complete?	Yes	No
4. Did your "artist" erase often?	No	Yes
5. Did anyone try to correct himself while giving directions?	No	Yes
6. Did the "artist" fail completely to understand a direction?	No	Yes
7. Did you complete the game before time was called?	Yes	No

Rate yourself -- Score ____________

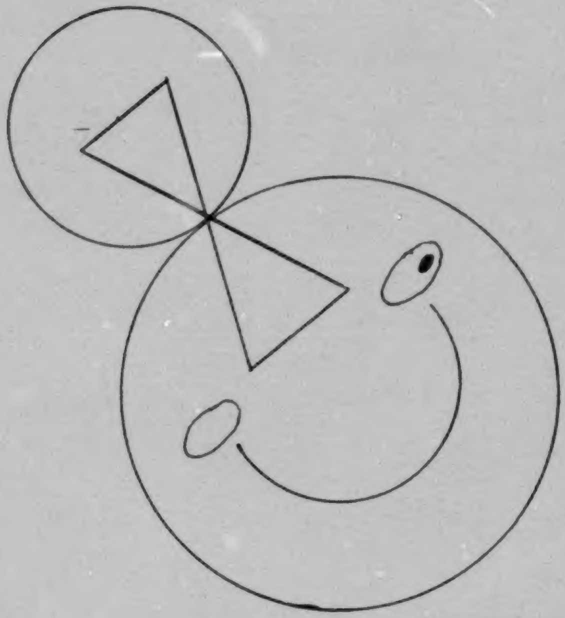
Column 1 = plus 1 point
Column 2 = no point

Discuss Briefing: As a group, what can you do to improve your direction giving skills?

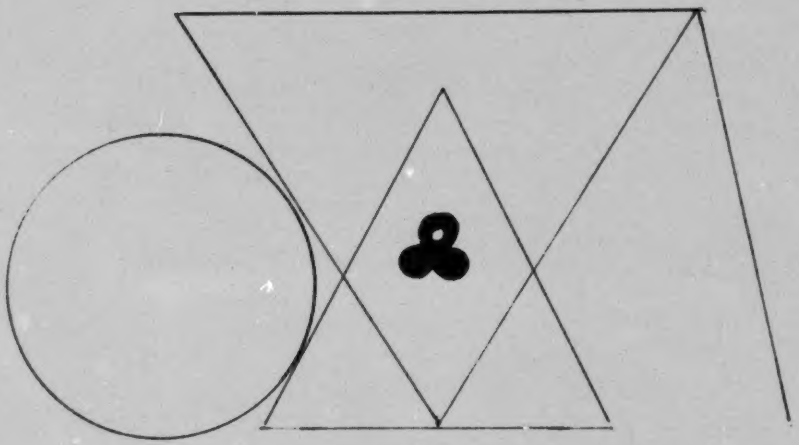
Answer these questions after game two -- Did you improve? Why?

Examples of Abstract Designs

#1



#2



Title: Throw 'n' Take
Developer: Karen First and others

Overview:

The goal of this game is for children (grades 3 through 8) to develop a process or strategy of winning within the given rules.

Instructional Objectives:

1. To increase the players' memory, recall, and concentration skills.
2. To develop good strategies of fair play.
3. To analyze your own position in the game in relation to the position of others.
4. Learning inference and how to predict the winner.

Materials:

1. Dice
2. 8 chips per participant.
3. Prediction cards - 32 per game (blank cards).
4. 8 pencils.

Rules and Procedures:

1. No verbal or non-verbal communication except for asking for chips.
2. Each player gets 8 chips to start each set.
3. High die begins. Roll off between ties.
4. Each player rolls in turn clockwise around the group.
5. A player rolls the die, then he must ask for the number of chips from any player he chooses. If that player doesn't have enough chips to give, he gets to take the requested number of chips from the requester.
6. Players should keep their chips concealed.
7. Three times around the board equals a set.

8. At the end of a set, players must try to identify the individual who has the most chips and write that name on the prediction card. Each player must then identify himself and the number of chips he has on the other side of the card. Then points are awarded and recorded by the group's recorder.

9. Four sets equal one game.

10. The winner has the most points at the end of the game. Points are recorded for the following:

    a. One point for the most chips at the end of each set.

    b. One point for identifying the person with the most chips at the end of each set. (In case of a tie, each player receives a point.)

312 - 328

Module 7

Department/Context: Educational Media and Technology/Educational Technology

Subject/Topic: Instructional Media and Mediated Instruction/Design and Construction of Materials

Title: Preparation of Locally Produced Instructional Media

Prerequisite: Equipment Operation Laboratory

Overview: Student design and production of mounted visuals, overhead transparencies, lettered visuals, spirit duplicated materials, and use of Ektagraphic copy camera.

Rationale: In the classroom the chalkboard no longer serves as the primary mode for illustrating or amplifying ideas. Instructional tapes, records, films, overhead transparencies, filmstrips, slides, and many other specialized devices and materials are used singly and in concert to facilitate learning. Although a wide range of commercially produced media is available, instructional media prepared by teachers frequently offers the most practical approach to mediating specific learning situations. Teachers are often frustrated, however, in their efforts to meet a learner's needs because they may not have acquired the necessary skills to produce these media. For these reasons, this module offers its content and experiences to the pre-service teacher.

General Objective: To develop understanding and skill in the preparation of instructional media and duplication procedures.

Enabling Objectives:

1. Given lettering stencils and pens, and appropriate materials, to produce an instructional message that is legible, centered, has uniform size and spacing of letters, without error.

2. Given appropriate equipment and materials, to produce multiple spirit duplications that have at least one illustration, and contains some form of lettered or printed copy (meeting criteria in 1, above). The illustration should be recognizable, clear of extraneous marks, not skewed, and be produced in at least five clear copies, without error.

3. Given appropriate equipment and materials, to produce a heat process spirit master that contains at least one illustration and some form of lettered or printed copy. The original must be clear black and white, and the spirit copy must be legible, and centered, with at least 5 copies, without error.

4. Given appropriate materials and equipment, to mount a magazine picture, selected for an instructional purpose, with rubber cement using a permanent mounting. There should be no traces of rubber cement, wrinkles or bubbles, and have even margins, without error.

5. Given appropriate materials and equipment, to mount a magazine picture, selected for an instructional purpose, with dry-mounting tissue whose completed form will not show tissue residue, which will have even margins, be free from folds and air pockets, and have even adhesion, without error.

6. Given appropriate materials and equipment, to laminate the dry-mounted picture (in 5, above) so that the picture shows no bubbles or creases, and the lamination material does not exceed the outer edge of the cardboard, without error.

7. Given appropriate equipment and materials, to illustrate and letter, by hand, an instructional overhead transparency whose illustration is recognizable, clear of extraneous marks, and whose letters are at least 3/8" high, legible, evenly spaced, and does not exceed six words, without error.

8. Given appropriate equipment and materials, to produce a heat process overhead transparency that contains at least one illustration and some form of lettering or printed copy, whose original is clear black and white, without extraneous marks, and whose copy is legible and centered, without error.

9. Given appropriate equipment and materials, to produce an overhead transparency with at least one overlay, using any or all production techniques for producing transparencies where the overlay(s) is in register, lays flat, and is firmly hinged to the transparency frame, without error. (Objectives 7 and 8, above, may be combined to meet this objective).

10. Given appropriate equipment and materials, to produce a heat process color-lift overhead transparency that is free from clay residue and wrinkles, that has a sharply defined image and color(s), and no blank spots, without error.

11. Given appropriate material and equipment, to adhere an illustration to a cloth-mounting material that is without wrinkles or creases, and where the clothbacking does not exceed the outer margins of the picture, nor do the outer margins of the picture exceed the cloth backing, without error.

Instructional Procedures:

1. Sign up for four (4) hours in the Media Production Laboratory (U-Hall 200E).

2. Pick up packet of production materials from U-Hall 200E.
3. Purchase or borrow at least one felt marking pen (e.g., Magic Marker, El Marko, Marksalot).
4. Bring in 5 color magazine pictures that range in size between 4" x 5" and 8" by 10".
5. Choose either of the following procedures:
    a. Testing-out procedure: Produce the materials specified by the 11 stated objectives.
    b. Self-instructional Procedure: For each objective:
        1) Read the directions included in this packet, and/or
        2) View the appropriate 8mm film loop
        3) Produce the specified instructional material, to meet a behavioral objective that you choose or write.
6. Have produced material evaluated by instructor or graduate assistant, using the criterion checklist.
7. Continue procedure until all materials have been produced and evaluated as acceptable by stated criteria.

Assessment: See the enabling objectives.

310 - 328

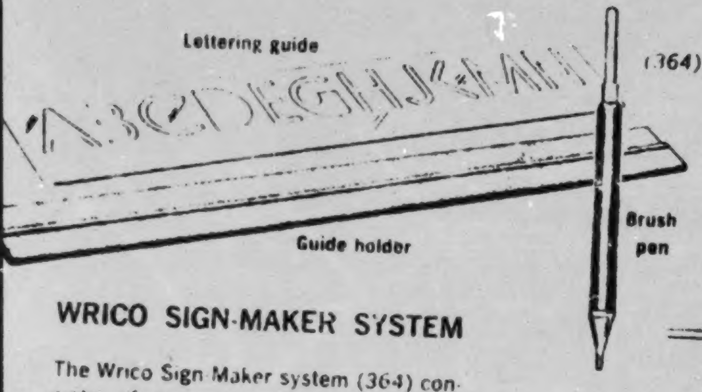
Checklist
Module 07: Preparation of Locally Produced Instructional Media

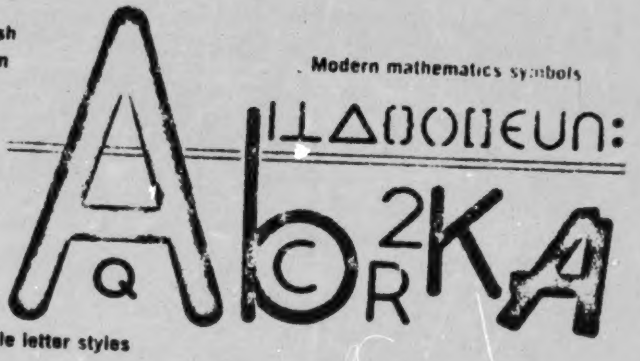
Name ______________________ Term ________
Last, First

______________________ Advisor ________________
Evaluator

Objective	Criteria	NC	AC	MC
a. lettering with stencil & pens	1) Legible 2) centered 3) uniform size 4) appropriate spacing of letters 5) agree with student objective			
b. spirit duplication containing illustration & lettered copy	1) lettered copy meet criteria in "a", & illustration meet following criterion. 2) recognizable 3) clear of extraneous marks 4) not skewed 5) at least 5 clear copies 6) agree with student objective			
c. heat process spirit master of illustration & lettered copy	1) clear black and white original 2) legible copy 3) centered copy 4) at least 5 copies 5) agree with student objective			
d. mount magazine picture with rubber cement on permanent mounting	1) no residue of rubber cement 2) no wrinkles 3) no bubbles 4) has even margins 5) agree with student objective			
e. mount magazine picture with dry-mount tissue	1) not show tissue residue 2) has even margins 3) no wrinkles 4) no air pockets 5) smooth and even adhesion 6) agrees with student objective			

Objective	Criteria	NC	AC	MC
f. Laminate a dry-mounted picture	1) no air pockets 2) no wrinkles 3) lamination material does not exceed the outer edge of the cardboard 4) agrees with student objective			
g. to hand illustrate an overhead transparency	1) illustration is recognizable 2) illustration clear of extraneous marks 3) letters are at least 1/4" high 4) letters are legible 5) letters are evenly spaced 6) letters do not exceed six words 7) agrees with student objective			
h. Heat process overhead transparency containing both illustration & lettering	1) original is clear black & white 2) original without extraneous marks 3) copy is legible 4) copy is centered 5) agrees with student objective			
i. overhead transparency with overlay	1) overlay is in register 2) overlay lays flat 3) firmly hinged 4) agrees with student objective			
j. Color-lift transparency	1) no clay residue 2) no wrinkles 3) no air pockets 4) image sharply defined 5) color(s) sharply defined 6) no blank spots 7) agree with student objective			
k. cloth-back a picture	1) no creases 2) no wrinkles 3) cloth-backing does not exceed edge of picture 4) picture does not exceed cloth edge 5) agrees with student objective			


Lettering guide
(364)
Brush pen
Guide holder

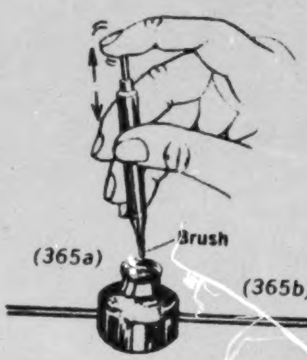

Modern mathematics symbols
Sample letter styles

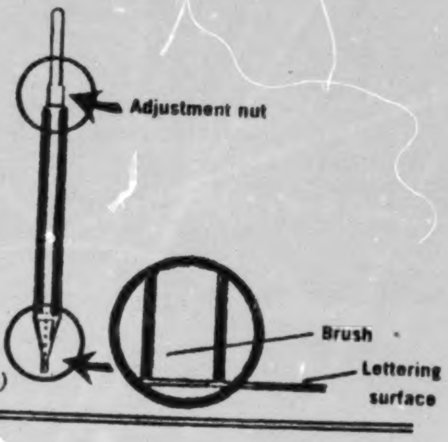
WRICO SIGN-MAKER SYSTEM

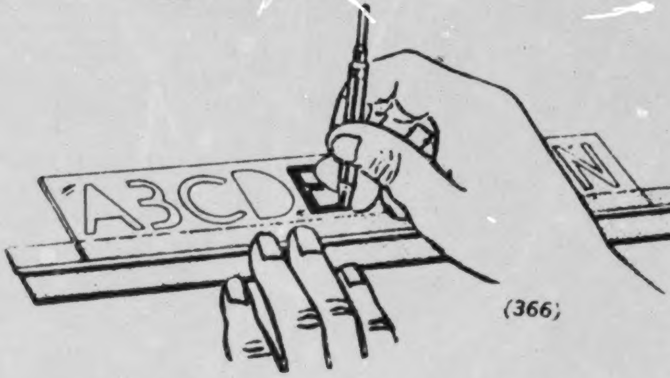
The Wrico Sign-Maker system (364) consists of transparent plastic lettering guides, a metal guide holder, and a brush or felt-point pen. Letters range in height from ⅛ to 4 inches. There are a number of letter styles to choose from, including modern mathematics symbols. The Sign-Maker is an ideal lettering system for preparing posters; signs; charts; graphs; maps; television, filmstrip, motion picture, and slide titles; flash cards.

Instructions

1. To fill the pen (*365a*), press plunger down and insert only the brush portion of the pen in ink, and without raising the pen, release the plunger slowly. The pen is now ready for use. To adjust the pen properly for use, twist the adjustment nut until the end of the brush is even with the end of the tip of the pen. If the brush is not out far enough, turn the nut to the right. If the brush is out too far, turn the nut to the left. Finally, turn the adjustment nut a quarter of the way to the left so that the brush is recessed slightly; this will permit the ink to flow freely under the brush and allow for well-inked lines (*365b*).
2. Place the metal guide holder on the surface to be lettered so that the rubber strips on the bottom of the holder set firmly upon the surface (*366*). Then rest the lettering guide




Adjustment nut
(365b)
Brush
Lettering surface

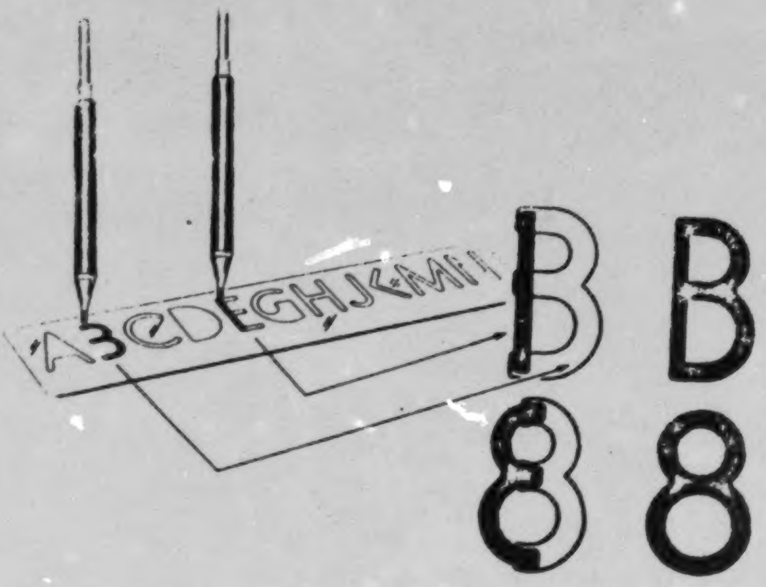


in the channel of the guide holder. This permits the guide to be moved smoothly to the right or left without touching the surface to be lettered, thus preventing ink smudges. The guide holder stays securely in position wherever it is placed. This eliminates the necessity for such accessories as straightedges, weights, thumbtacks, or tape.

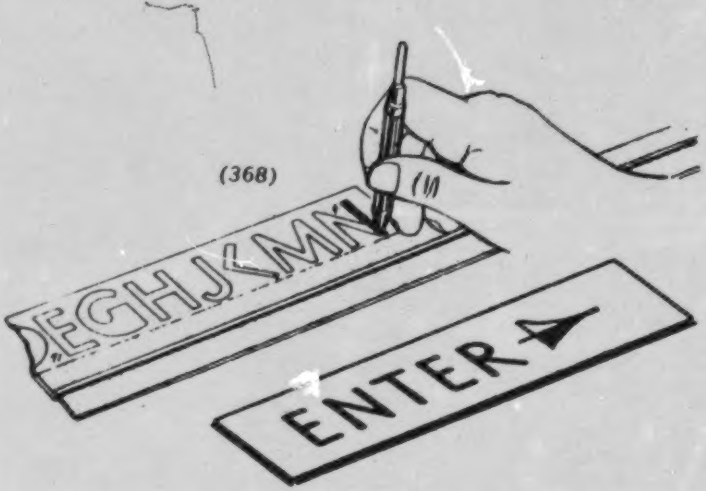
Move the lettering guide so as to position the first letter where desired on the lettering surface. Insert the pen in the first letter. Hold the pen vertically and glide it through the letter form. Best results are obtained with very light pressure on the point. Many of the characters, both letters and numbers, are made complete with a single opening. Some require two openings. For example, when making the letter B (367), use any vertical line and then move the guide until the curved portion of the B is in position to complete the letter.

Slide the guide to the next letter and repeat the process (368).

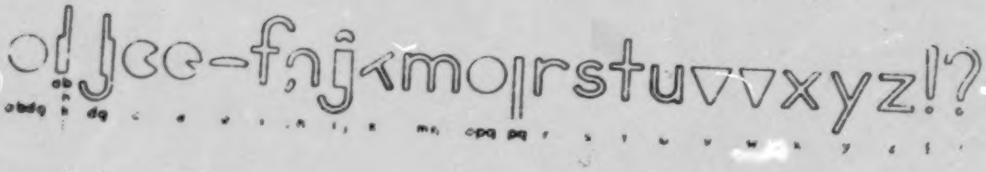
The lowercase letters c, f, i, j, l, m, n, o, r, s, t, u, v, x, y, and z are made by simply following the proper openings (369). The other letters require two openings. Part of the letter is made with one opening and completed with the other. The openings used for these letters are also indicated.



(367)



(368)



(369)

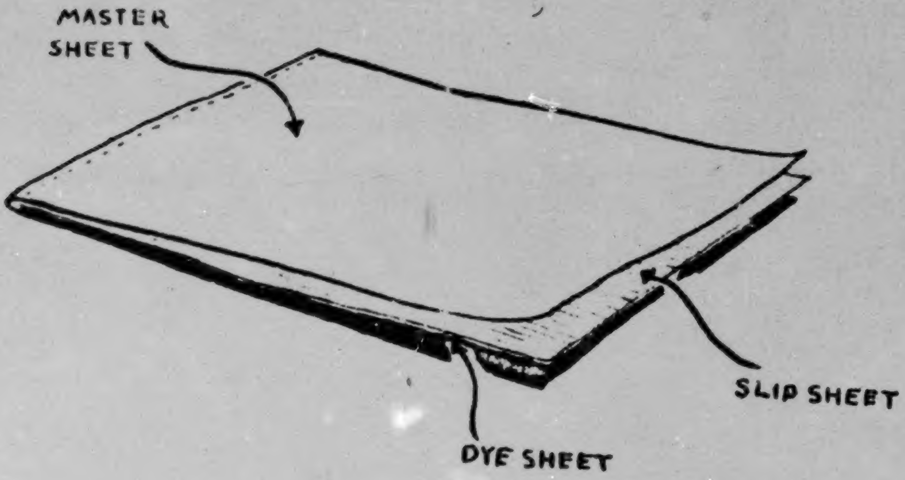
pirit Process Duplication

iple paper copies of materials needed in teaching can be produced by many Perhaps the easiest and least expensive method to make multiple copies is rit duplicator. This machine, no matter what the brand name, is usually he "ditto" machine and is found in almost every school.

spirit or ditto process is based upon the transfer of a soluble dye from a to the copies. As the blank copy paper starts through the machine, it is ed with a solvent. As it continues through, it is pressed against the master. vent dissolves a small amount of the dye on the master. The dissolved dye to the copy sheet. When the paper comes out of the machine, the writing ng on the master has been reproduced on the copy. Each time the handle nachine is turned, another copy is produced until the dye on the master is d.

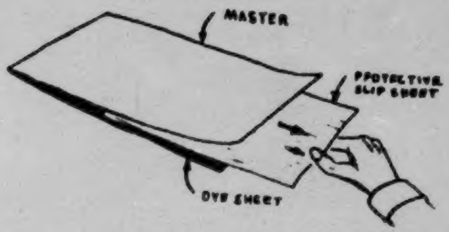
peration of spirit duplicators is quite simple once the user gets to know hine. Each brand is a little different, but the same basic controls will be n all. It is a good idea to ask an experienced operator to "take you an unfamiliar machine before you use it. This section will cover basic on regarding spirit duplicators and the preparation of masters from pies are printed.

masters are usually supplied as a unit, composed of the master sheet and heet, which is similar in appearance to heavy carbon paper. The dye sually attached to the master sheet at one end. A thin protective slip aced between the master and dye sheets to prevent any transfer of the he master sheet during handling.

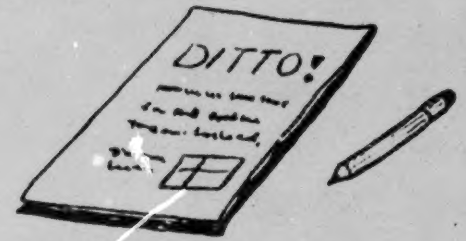

MASTER SHEET
SLIP SHEET
DYE SHEET

Preparing the Master

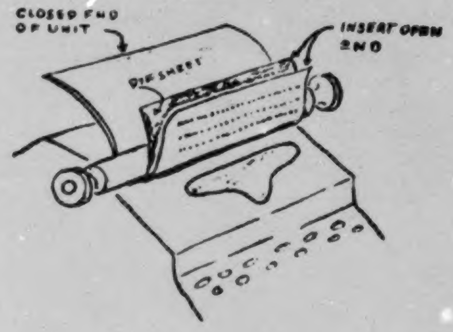
1. Remove the slip sheet from the unit before starting to work.


MASTER
PROTECTIVE SLIP SHEET
DYE SHEET

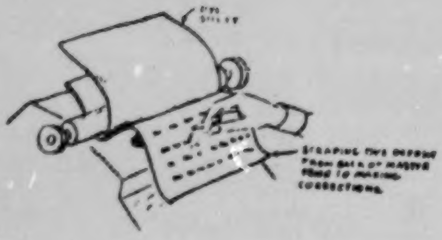
2. Write or type on the surface of the master. Even and firm pressure is desirable. The pressure of typewriter key or pen against the master causes the transfer of the dye.



Typing errors should be corrected before the master unit is removed from the typewriter. If the open end of the master unit is inserted in the typewriter, the typist will have easy access to the back of the master page when making corrections.


CLOSED END OF UNIT
INSERT OPEN END
DYE SHEET

'o make corrections, roll the master nit forward far enough to separate he master and dye sheets at the error. 'sing a sharp knife or razor blade, arefully scrape the dye deposit from he master at the point of error with- ut breaking the surface of the mas- r. Next, cut or tear a small piece of e dye sheet from a corner or other argin area. Place the piece behind master so that it will cover the a to be corrected. Roll the unit k in the machine and type the cor- t letters on the master. Remove the ce of dye sheet before continuing. rrection pencils and tapes designed this purpose simplify corrections.


DYE SHEET
SCRAPING THE DEPOSIT FROM BACK OF MASTER PRIOR TO MAKING CORRECTIONS.

'o draw or hand letter on the stencil, place the master unit on a firm, smooth face. For thin lines, use a ball point pen; for wider lines, use a 3h or 4h pencil pened or worn down to produce the desired line width.

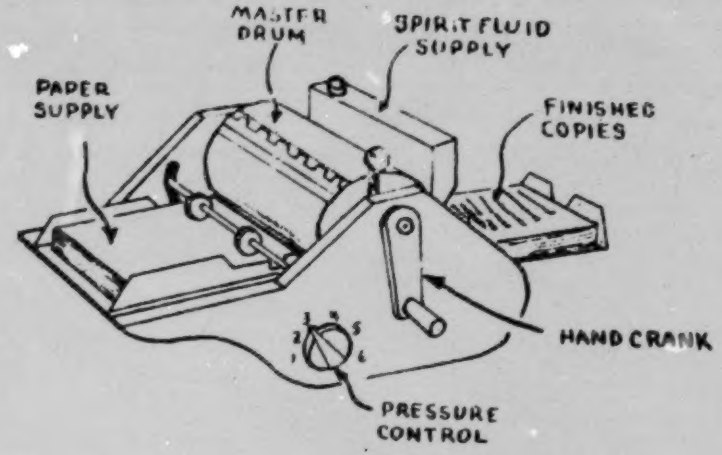
you are confident of your skills, make your drawings directly on the master. ou prefer to experiment first or copy a drawing, do so on tracing paper. Clip paper to the master, and go over the lines with enough pressure to transfer the

olor adds much to duplicated materials. The most commonly used dye sheets a purple image because more copies can be obtained from purple dye. Red, n, blue, and black dye sheets are available at a slightly higher price. Making a icolor master involves nothing more than moving the master from one color heet to another and drawing or typing each area using a dye sheet that will uce the desired color. When the completed master is run, multicolored copies e produced.

ting the Spirit Duplicator

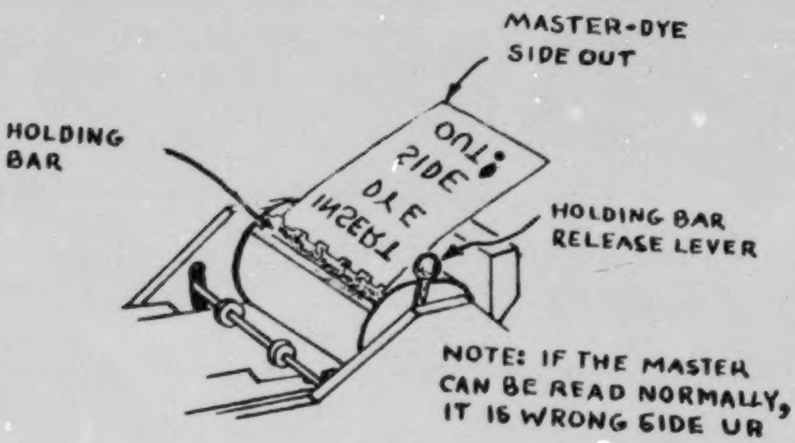
spirit duplicator probably gets more use than any other machine in a . Since almost every teacher will be using the duplicator at one time or r, each user should make sure that it is clean and ready for the next user. If ing appears to be wrong with the machine, notify the office so that it can ked and serviced by a repairman.

re starting work, be sure there is an adequate supply of duplicating fluid in d reservoir and that the machine is clean and ready for use. Before attach-


MASTER DRUM
SPIRIT FLUID SUPPLY
PAPER SUPPLY
FINISHED COPIES
HAND CRANK
PRESSURE CONTROL
1
2
3
4
5
6

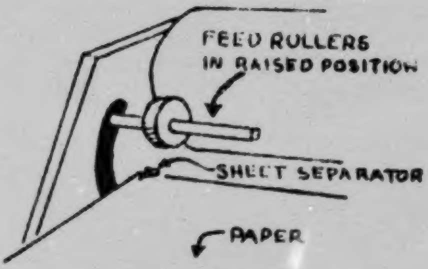
ing the master to the drum, turn the fluid on so that it will have time to flow into the moistening system.

The master sheet is inserted into the holding slot on the drum with the dye side out. One end will be secured by the bar, the other end is left loose. Be sure that the master is centered on the drum before closing the holding bar release lever.

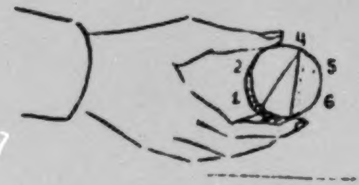

MASTER-DYE SIDE OUT
HOLDING BAR
INSERT DYE SIDE OUT!
HOLDING BAR RELEASE LEVER

NOTE: IF THE MASTER CAN BE READ NORMALLY, IT IS WRONG SIDE UP

Raise the feed rollers and place the paper in the receiving tray. The paper must be under and against the sheet separator so that only one sheet of paper will be fed into the machine with each turn of the crank. Then lower the feed rollers into place on the paper.

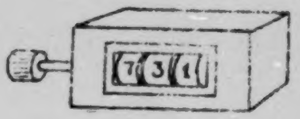


Set the pressure indicator to low or one. Increase the pressure setting every twenty-five or thirty copies. This will assure that the quality of the print will be consistent throughout the run and the master will produce more copies.



Be sure that paper is fed into the machine with each revolution of the crank. If the paper does not feed smoothly, stop the machine and check your adjustments. The two most common causes of feeding problems are: (1) the feed rollers have not been lowered into position on the paper supply, or (2) the pressure has not been turned on.

Some machines are equipped with a counter that shows the number of copies printed. A knob or wheel at the side of the counter can be used to re-set the counter to zero for each run.



When you have finished the last run, turn off the fluid and release the pressure. Be sure to leave the machine clean and ready for the next user. In all fairness to your colleagues do not ignore this unwritten law.

Cleanup, for the most part, is a simple process. Dye on the master drum can be removed with a clean cloth dampened with spirit duplication fluid. Cheesecloth is very absorbent and works well for cleanup. Any paper caught in or under the machine should be removed.

Thermocopy Processes

Basic terms used in this process are:

Original: The material from which a copy can be made.

Copy: Reproductions made from an original.

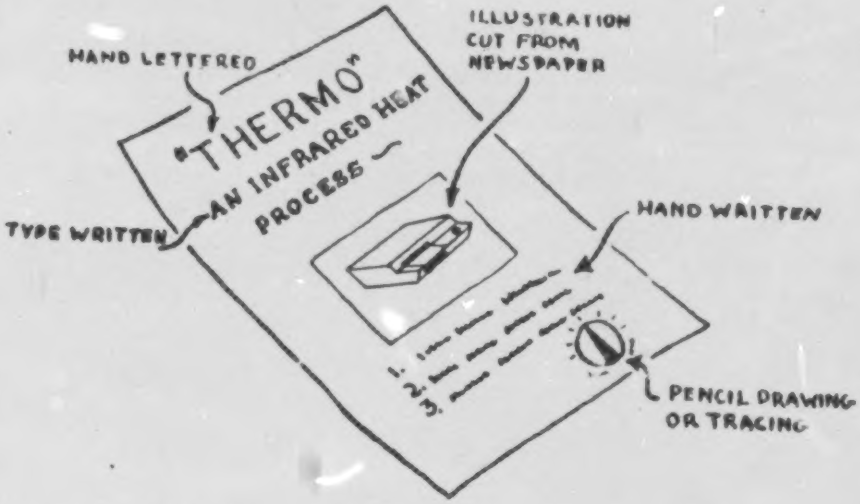
Set: The original and thermocopy material—assembled and ready to be inserted into the thermocopy machine.

In contrast to the diazo process which requires exposure to light and subsequent chemical development, thermo processes utilize materials that are sensitive to heat generated by an infrared lamp in the copying unit. It is a one-step process. The set is carried through the machine on a continuous belt and returned ready for use without any additional production steps.

Thermocopy materials have been designed to serve several different purposes. With a thermocopy machine it is possible to make paper copies, transparencies in black and white or color, spirit duplication masters, mimeograph stencils, and laminated originals. Assembly of the set and speed settings on the machine will differ according to the thermocopy materials being used, but the insertion of the set into the machine and the retrieval of processed materials is the same for all processes.

Preparing the Original

Good thermocopies can be obtained from commercially printed matter or from teacher-produced originals that have been printed, typed, or drawn on smooth white paper with soft pencil or India ink. Originals can also be prepared by combining printed materials from newspapers and magazines with typewritten or hand-lettered text and illustrations. (Illustrations and lettering not drawn on the paper should be attached with small pieces of transparent tape.)


HAND LETTERED
ILLUSTRATION CUT FROM NEWSPAPER
"THERMO"
— AN INFRARED HEAT PROCESS —
TYPE WRITTEN
HAND WRITTEN
1.
2.
3.
PENCIL DRAWING OR TRACING

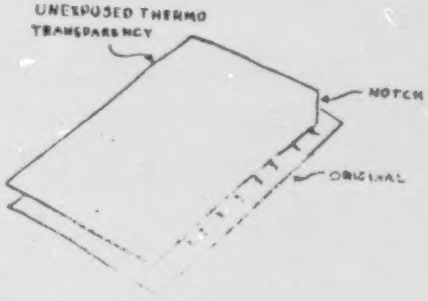
In order to obtain good copies, all printing, lettering, and illustrations must have clear, solid black lines. Colored lines or areas usually cannot be reproduced using the thermocopy process.

Suitable for Thermocopy Process	Unsuitable for Thermocopy Process
Typewritten text (must be sharp and black)	Ditto or spirit process prints
Carbon copies (use the first carbon)	Many fountain pen inks
Mimeographed copies	Most felt pens
Printed Materials	Most ball point pens
India ink	Colored pencils
Pencil (use a soft #2 pencil)	Printed colors (will not reproduce at all or will be copied as black or grey)

Transparencies

Black line transparencies on a clear or tinted background are prepared in this manner.

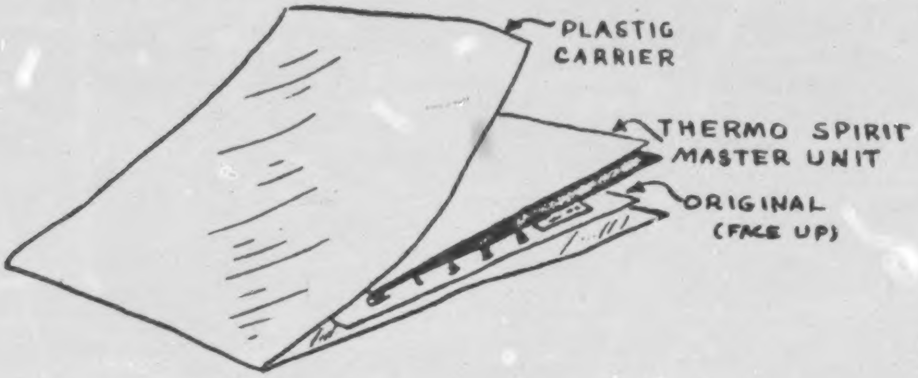
1. Select the proper control setting, which is normally in the medium range.
2. Make a set of the original, face up, and the infrared-sensitive transparency sheet with the notch in the upper right-hand corner.
3. Insert the set into the copy machine with the transparency sheet on top.


UNEXPOSED THERMO TRANSPARENCY
NOTCH
ORIGINAL

Spirit Masters

Masters for use on the spirit duplicator are prepared by the following method. To avoid problems always use a plastic carrier.

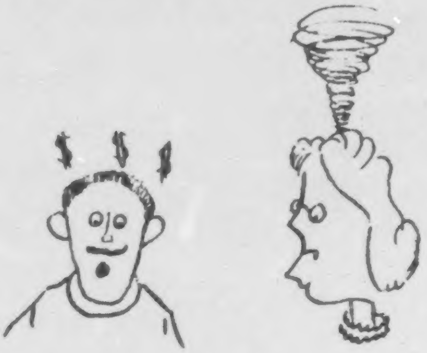
1. Select the proper control setting, normally in the light range.
2. Make a set as follows using the plastic carrier purchased from the supplier.
   a. Place original face up in the carrier.
   b. Place thermo master over original with the thin paper side up. (Be sure to remove the protective paper found between the dye sheet and the front of the unit.)

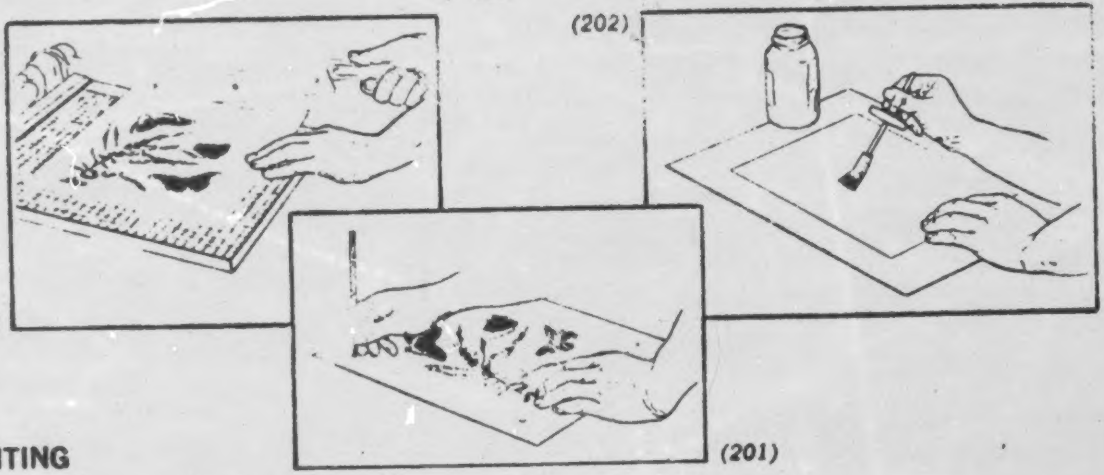


3. Close the carrier and insert in machine, hinged end first.
4. After exposure, separate the plastic dye sheet from the paper master with a gentle peeling motion. Remove the paper master from the dye sheet and the master is ready to use in the spirit duplicator.

Depending upon the manufacturer, these units may be identified as "Thermo Masters," "Thermo Spirit Masters," "Transofax Units," or other similar names. They are specially manufactured for use in the thermo equipment. Regular spirit master units will not work in this process. Placement of the original may vary depending upon the units purchased. Check the directions on the box.

Never use staples, paper clips or other metallic materials on sets which will be used in a copy machine. They will damage the transport belt and rollers.





(200)

(201)

(202)

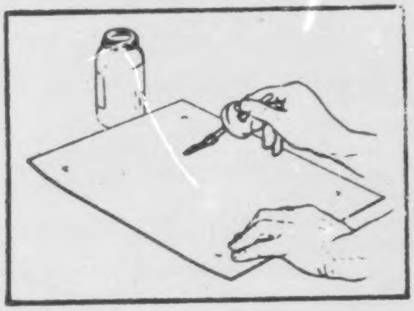
LD MOUNTING

BBER CEMENT MOUNTING

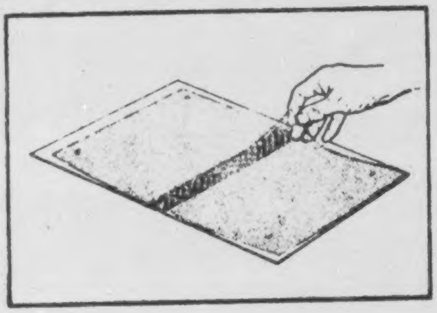
bber cement mounting is a quick,
y, and clean technique. It is ideal for
unting many flat instructional ma-
ials such as prints, photographs,
wings, and precut letters. Rubber
nent is an easy-spreading adhesive
joining paper to paper, cloth, leather,
ss, metal, wood, and other surfaces.
od-quality cement is nonwrinkling,
ncurling, and easily removed from
nporous surfaces by rolling it off with
gers or a rubber cement eraser. To
sure good adhesive quality, the cement
ould be stored in brown bottles and
pt away from high temperatures. It
ould be thinned with rubber cement
nner (solvent) if the cement does not
w freely from the brush used to apply
Special plastic or glass dispensers
with a built-in brush are available.

Before starting the mounting, trim the visual to the desired size (*200*). The trimmed visual is then positioned on the mounting board, and a small, light pencil guideline is placed at each corner (*201*). A thin, even coat of rubber cement is applied (*202*) to the back of the visual. This should be done with smooth, even brush strokes, making sure the entire surface is covered. Going back over rubber cement which is not thoroughly dry will cause scuffing and produce a rough surface; the result will be an imperfect mounting.

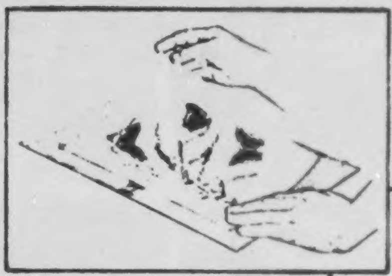
Apply a coat of rubber cement to the mounting board, extending it slightly beyond the guide marks (*203*). Better adhesion will be assured if the brush strokes are at a 90° angle to those used on the back of the visual. Allow the

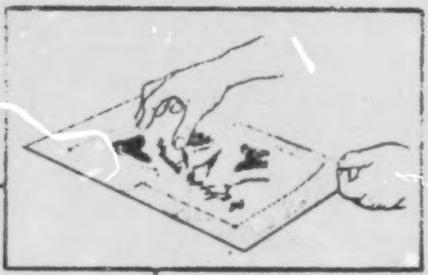


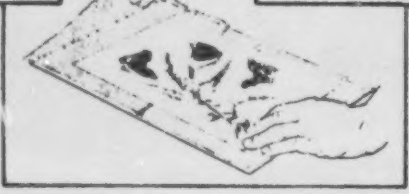
(203)



(204)


(205)

(207)


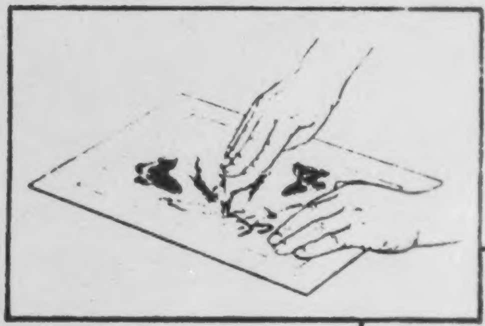

(206)

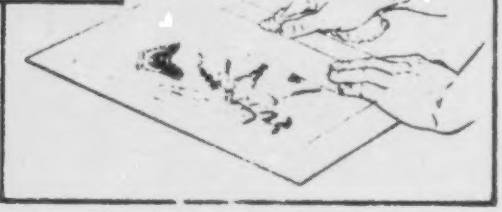
rubber cement to dry. Place two sheets of household wax paper on the cemented surface of the mounting board so they slightly overlap at the center (*204*).

The wax surface prevents the visual from adhering to the mounting board during positioning. Place the visual on the wax paper with corners registered on the guide marks (*205*). Firmly hold the lower half of the picture in place as the top sheet of wax paper is withdrawn (*206*). This permits the two rubber-cemented surfaces to come into direct contact with each other. Next, remove the bottom wax sheet (*207*).

Finally, smooth down the surface of the visual, starting in the center and working in an outward direction (*208*). It is advisable to use a protective sheet of clean paper over the visual to prevent damage to the surface (*209*). Often a small rubber roller is used for this purpose. When the visual is firmly mounted, remove excess rubber cement by gently rubbing with a finger along the edges of the visual. A rubber cement eraser can also be used to remove excess cement. Erase the guide marks, and the mounting is completed (*210*).

The technique of mounting just described is often referred to as a permanent method. It is not truly a permanent mounting, however. The quality of the rubber cement used, the mounting technique used, and the storage conditions will determine to a great extent how long the mount will last.


(208)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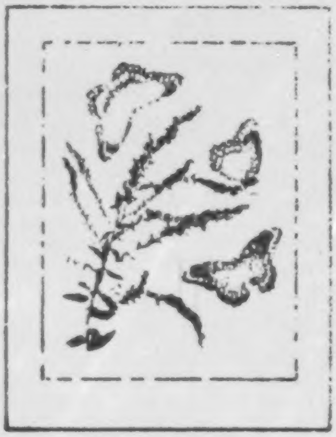


WAX MOUNTING

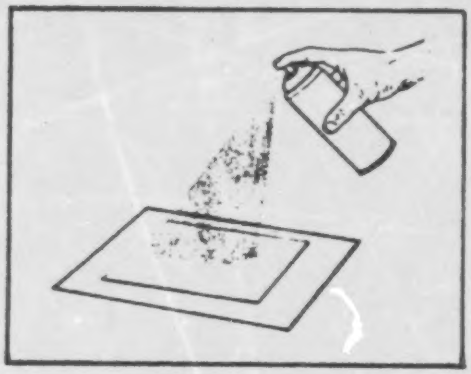
Wax adhesives have become a very popular mounting substance, especially for people involved in the process of assembling paste-up art materials or creating displays involving three-dimensional objects. This family of adhesives may be found in several forms.

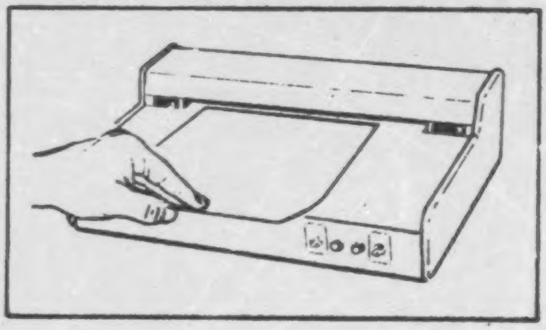
For the person interested in creating displays, including both two- and three-dimensional materials, there is a wax adhesive stick often referred to as bulletin-board wax. To use, take a small portion of this wax, roll it into a small ball, and place it on the contact point of the material to be mounted. Then position the material on the surface it is to be mounted on and press it firmly into place. This method can be used to suspend flat materials and lightweight three-dimensional objects. When the material is removed from the display, the small lump of wax may be scraped off and used again.

Another form in which wax adhesive material may be procured is that of wax discs. These are small plastic discs coated on both sides with adhesive wax. They may be obtained in a variety of sizes depending upon the size of material to be mounted. The disc is placed at the contact point of the material to be mounted and pressed against the mounting surface.

Spray wax adhesive in an aerosol can is excellent for coating materials with a pressure-sensitive coating of wax. It is waterproof, wrinkleproof, colorless, and fast drying. It is used primarily on two-dimensional materials. One of its most important characteristics is that it will permit repositioning of material on the mounting surface. When the final position is decided upon, burnish the material down with a hard, smooth instrument. Spray wax adhesive is easy to use. Place the material to be coated face down on a large, clean piece of paper. Spray evenly over the back of the material (*211*) in a smooth back-and-forth motion, being sure to coat the edges thoroughly. Allow a short time for drying. The material is then ready to press in place. For removing unwanted adhesive, follow the directions on the can.

The wax coating machine has been designed for people needing to coat quantities of material with wax adhesive. It is an electrical device for heating and applying adhesive wax. These wax coaters range from small hand-held spreaders to automatic paper-fed machines capable of handling large sheets. As the material passes through the machine (*212*), it is coated with a layer of pressure-sensitive wax. Material coated by this method may be adhered to surfaces such as paper, plastic, foil, film, tissue, and fabrics. As with spray wax adhesive, this material may be repositioned. When the final position is set, the material is then burnished into place.


(*211*)


(*212*)

Mounting Instructional Materials

Dry Mounting

Basic terms used in this process are:

Dry Mount Press: A machine designed to provide even heat and pressure when dry mounting flat materials.

Tacking Iron: A small iron used to prepare materials for the press.

Dry Mounting Tissue: Thermo-adhesive sheet with an adhesive coating on both sides.

Cloth Backing: White cloth with a thermo-adhesive coating on one side.

Laminating Film: Clear plastic sheet with thermo-adhesive coating on one side.

Set: Materials assembled and ready to be placed in the dry mounting press.

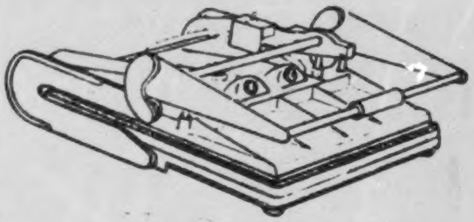
Dry mounting is an easy, safe method for attaching flat materials such as documents, illustrations, photographs, and printed matter to a stiff backing without using liquid adhesives. It can also be used to laminate the surface of flat materials with a protective plastic coating or to attach a flexible cloth backing to large maps or other display items that need to be protected or strengthened. Laminated illustrations printed on certain kinds of paper can be transferred from the paper to the laminating film and used as transparencies on the overhead projector.

A dry mounting press is required for most of the processes described here. The press is actually little more than a large flat iron designed to provide the proper

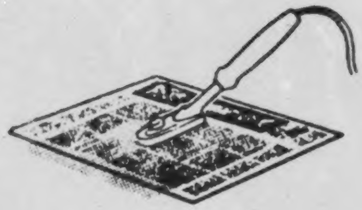
Press Operation and Basic Dry Mounting

Press operation and the assembly of the set is simple. Before beginning work, turn the press on and select the proper temperature. The directions here are for general purpose dry mounting tissues.

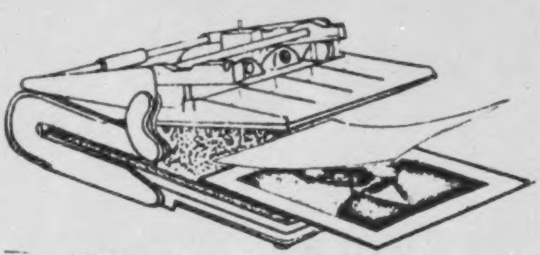
1. Set the temperature control to 225 degrees. On most presses a green light will glow until the press reaches the selected temperature.

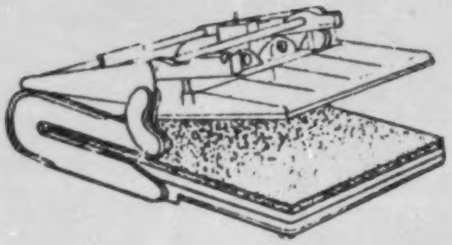


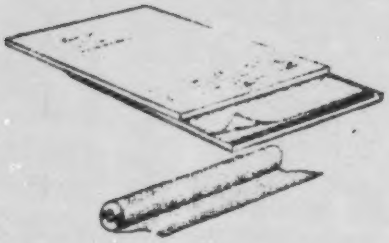
2. Pre-heat the tacking iron to a medium heat. If a tacking iron is not available, the tip of a hand iron will do just as well.



3. After the press is hot, the picture and backing should be pre-heated for about a minute to remove any moisture that might cause bubbles in the finished product. Always use a clean cover sheet for both front and back of the set to prevent materials from sticking to the press. A large sheet of ordinary school newspaper paper works well as a cover sheet.



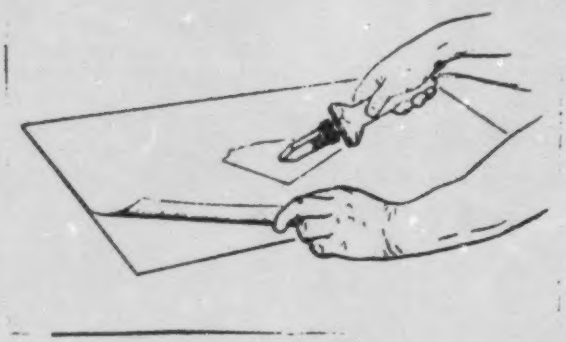




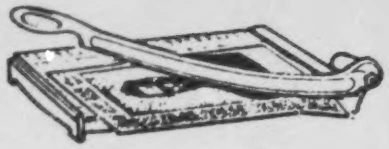
combination of heat and pressure. Most presses have a temperature selector so that the correct heat for dry mounting, cloth backing, or laminating can be selected.

The temperature for most dry mounting work ranges between 180 degrees and 270 degrees. If your press does not have a temperature control, check the temperature with a moistened finger. The platen should be hot enough to produce a slight sizzle. The time and temperature required will vary depending upon the materials to be mounted, and the backing used. It is necessary to experiment with various materials until you have had enough experience with the machine to know how the process and the press work.

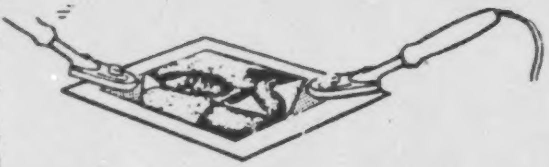
4. Place the picture to be mounted *face down* on a clean surface and cover with a sheet of dry mounting tissue. Using the tacking iron, tack the tissue to the back of the illustration in the center only. Use care to avoid wrinkling the tissue or the picture.



5. Trim the picture and tissue together to the desired size. This will eliminate excess tissue projecting from the edge of the illustration. If a paper cutter is not available, use a metal-edged ruler and a sharp knife. Scissors do not work well.

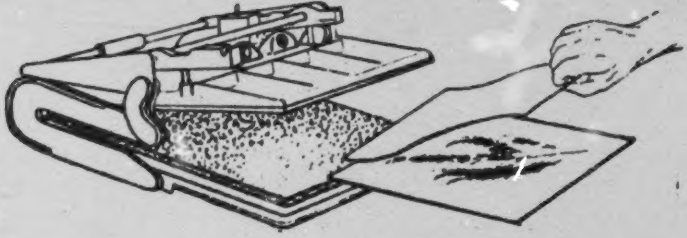


6. Position the trimmed tissue and illustration on the mounting board. Since thermo-adhesive tissues are not adhesive at room temperatures, the print can be moved freely and placed exactly where you want it on the mount. When the print is in position, lift the corners of the illustration and tack the tissue to the mounting board.

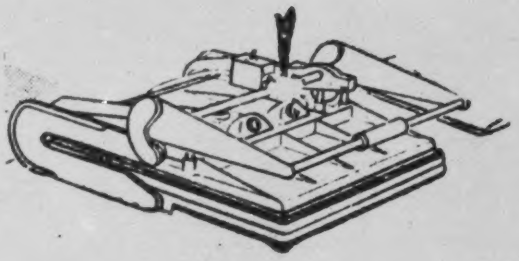


Do not tack through the illustration this may cause wrinkles in the finished product. The picture is now fastened to the tissue and the tissue to the mounting board. This ensures against shifting of materials during the rest of the process and still allows both picture and tissue to lie completely flat.

7. Place the set in a clean cover folder, insert face up, and close the press. Average magazine prints require eight to ten seconds to bond. Heavier materials may require additional time.



Some dry mounting presses have a red light that flashes once each second while the press is closed. The flashes are not entirely accurate, but they give an indication of how long the material has been in the press.



If bubbles show up in the mounted picture, the bond is not complete and the materials should be returned to the press. To prevent curling of the mounted picture after removal, place it under a weight while cooling.

Cloth Backing

In this section thermo-adhesive cloth backing will be referred to by the trade name *Chartex*. Chartex can be applied to flipcharts, graphs, maps and other large instructional materials. Chartex-backed materials can be rolled, folded, and hinged for easy storage and use.

Chartex is smooth on one side and rough on the other; the smooth side is the adhesive side. Chartex can be applied successfully to small materials with a household iron. To be absolutely sure that the cloth has bonded to the materials, use a dry mounting press whenever possible. The press is designed to provide the heat and pressure required to produce a good bond.

Directions for application of Chartex are:

1. Preheat the press to 200 degrees.
2. Pre-dry the materials to be backed and iron out wrinkles.
3. When working with large materials, place the materials face up on the smooth adhesive side of the Chartex.
4. Mark the corners of the map or chart on the Chartex with a pencil. Determine how much additional backing should be allowed at the top and bottom to attach hooks or hanger bars. Cut the Chartex to size with sharp scissors or a metal-edged ruler and a sharp knife. Press the ruler down firmly while cutting.
5. Tack along one edge to minimize problems of wrinkling and buckling. Avoid marks by using a clean sheet of paper between the tacking iron and the illustration.

6. Place the material and backing between protective paper sheets and insert in the press. If the materials are larger than the press, take several "bites" with the press to cover the entire area. In this case it is a good idea to start in the center of the material and work out to the ends. When positioning a new section in the press, be sure that the press will overlap an inch or two of the previously bonded section. With large materials, someone to help position the materials as they are moved may be needed.

Five to eight seconds should be enough to complete the bonding. If the bond is not complete, return the materials to the press for a few more seconds. Bonding is not complete until the materials have cooled completely. Keep the material flat until cool.

Laminating

Laminating film is a tough clear plastic coated on one side with a thermo-setting adhesive. Pictures, workbook pages, maps, leaves, fabrics, and similar materials can be laminated for display. In fact, any flat materials which are handled a great deal can be protected and preserved by lamination. It is also possible to use this process to transfer printed illustrations from certain types of paper to laminating plastic for use as overhead transparencies.

The rough or frosted side of the laminating film is the adhesive side. If you have matte finish laminating film, the adhesive side can be determined in two ways: (1) the plastic curls toward its adhesive side, and (2) the adhesive can be scraped from the plastic with a sharp blade.

To laminate flat materials pre-heat the press to 270 degrees. When the press is warm, pre-dry the materials to remove any moisture. Even though the adhesive film is not involved in the pre-drying, always use a cover sheet. Inks and some coatings will stick to the press if a cover sheet is not used.

After the materials have been pre-dried, this is the laminating procedure:

1. Place the materials to be laminated face up on a clean surface and cover with laminating film. The adhesive surface must be against the picture surface.

It is best not to tack laminating material even though it is thin and often difficult to handle. If it is necessary to tack the materials, tack carefully in the center of the illustration using a clean slip sheet between the tacking iron and the plastic. The slip sheet will help to avoid wrinkles in the plastic.

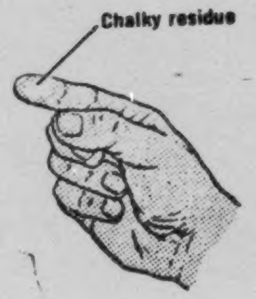
2. Trim the laminating plastic to the same size as the illustration to minimize the possibility of wrinkles or bubbles in the finished lamination.
3. Place the materials between clean cover sheets and insert in the press. One minute should be sufficient for most materials.

Silvery spots on materials removed from the press are bubbles and indicate that the material should be returned to the press until the adhesive has bonded to the illustration. Bubbles may occur for a variety of reasons. If moisture is the cause, pricking each bubble several times with a pin or knife point will release the moisture and allow the adhesive to adhere to the picture surface.

A final note, thin materials that have been laminated on one side will tend to curl. To prevent curling, laminate both sides of the illustration.

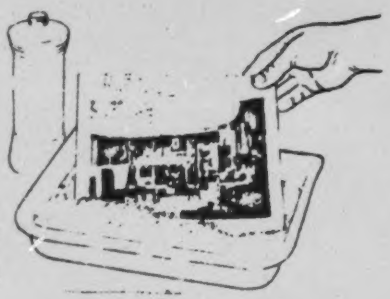
Picture Transfer

Transparencies for the overhead projector can be made from the clay-coated papers used in many popular magazines. To identify clay-coated paper, moisten your finger and rub a white portion of the page. If a white, chalky residue appears on your finger, the paper is clay-coated and the illustration can be transferred to laminating plastic.



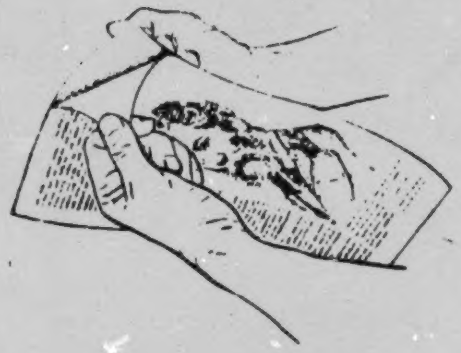
The directions for picture transfer are:

1. Follow the three steps previously described in the lamination process. For best results in the finished transparency, trim the laminating film slightly smaller than the magazine page and place it on the page without tacking. Cover and place in the press. Allow a little extra time in the press to assure a good bond.
2. After removing the page from the press, soak it in warm water. To

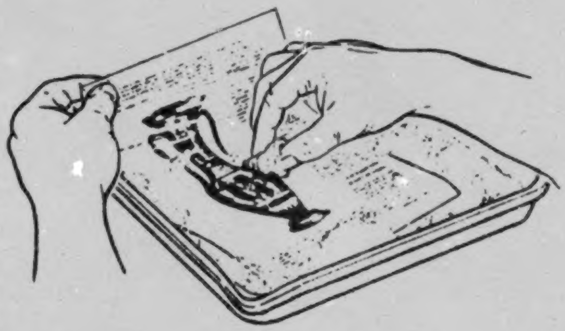


speed the soaking, add a few drops of liquid detergent to the water.

3. When thoroughly soaked, the paper can be separated from the plastic. Since the adhesive can penetrate the ink on the page but not the clay undercoating, the ink is transferred from the paper to the laminating film.

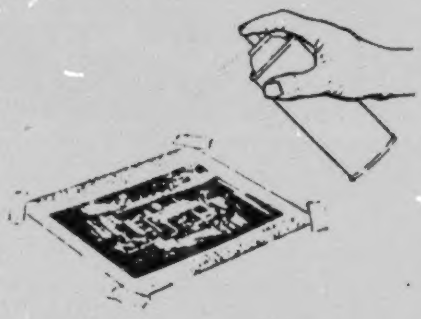


4. Next, scrub the ink side of the plastic with a sponge to remove any opaque clay residue. If the clay is not thoroughly removed, the transparency will be dull and lifeless.

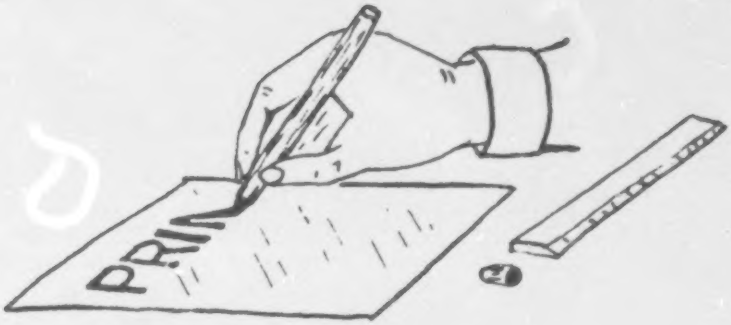


5. Rinse and dry the transparency thoroughly. To hold the plastic flat during the final step, tape the film, ink side out on a flat backing. A small piece of tape at each corner will do the job nicely. Coat the ink with a clear plastic spray and allow it to dry thoroughly.

6. Attach the finished picture transfer to a cardboard mount and it is ready to use.



Overhead Transparencies



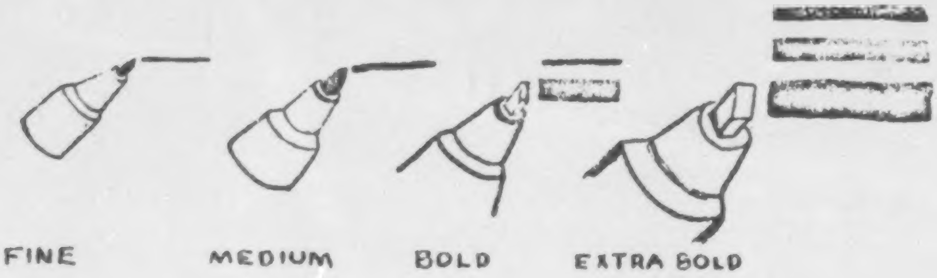
Hand-drawn transparencies are easy and inexpensive to make. They fill the gap between professionally produced transparencies, usually designed to serve a general instructional purpose, and a teacher's need for transparencies designed to meet a specific instructional goal. Depending upon the materials used, such transparencies can be temporary or permanent. They are prepared by tracing or drawing directly on clear acetate sheets with India ink, acetate inks, felt pens or special marking pencils.

Drawing Materials

Before buying any of these marking materials, try them out in the store to be sure that they will work on the acetate sheet. Some plastics take inks well and some do not. Some felt pens do not work well on acetates. Many grease or wax pencils are not transparent and regardless of their color will project as black lines.

Felt Pens

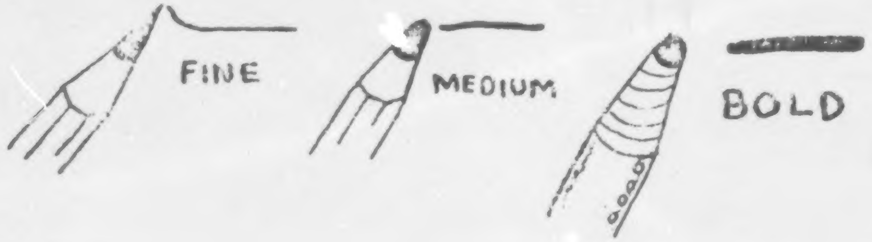
Felt pens are available in many colors and tips that will meet most production needs for hand-made transparencies. They can be used for lettering, lines, and colored areas.



Look for pens that contain permanent, waterproof, and quick-drying inks. Water-base felt pens, intended for use on paper, do not work well on acetates. Moisture, even perspiration on hands, may cause water-base inks to run on the transparency.

Pencils

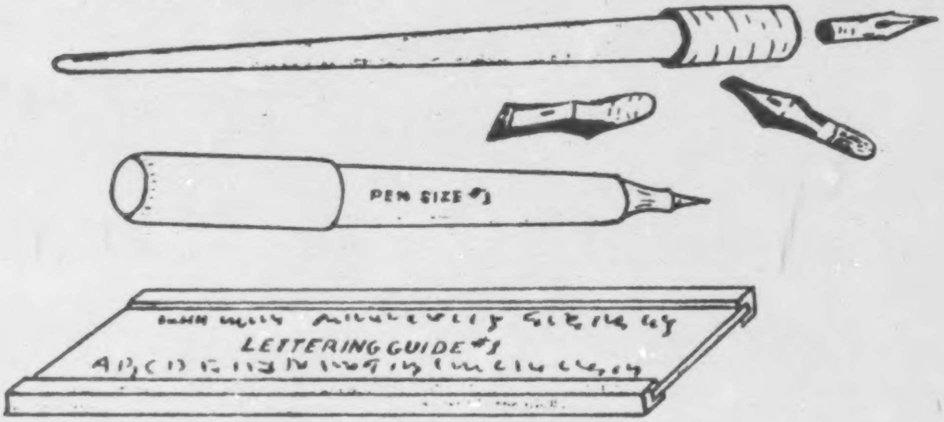
Grease or wax pencils are commonly used for temporary transparencies. They are available in several colors and can be erased with either a damp or dry cloth, depending on the pencil used. The lines can be narrow or bold depending upon the sharpness of the pencil. Check to be sure that the marking material in the pencil is transparent if a color line is desired on the projected image.



Inks and Pens

Some India inks and most acetate inks are permanent. More skill is required for their use than for the use of felt pens or grease pencils. However, more diversity in line size is possible since a variety of pen points and widths are available.

Reservoir lettering and line pens also work well on acetate. Lettering guides and reservoir pens are available in various sizes and line widths.



Some acetates will not take India ink well. Swabbing the surface with a weak ammonia solution will sometimes prepare the surface so that the ink will adhere to the plastic. Fingerprints will also cause the surface to reject ink. To avoid fingerprints, wipe the plastic surface carefully with a clean cloth or tissue before beginning work.

Production Tips

If the transparencies are to be mounted in standard cardboard mounts, the illustrated area should be no larger than 7-1/2 by 9-1/2 inches. Most acetates are supplied in 8-1/2-by-11-inch sheets. Allow a 1/2-inch margin at the top and bottom and a 3/4 inch margin on each side so that the illustrated area will fit the opening in the mount. (See directions for mounting transparencies and overlays in this section.)

When felt pens are used for lines and colored areas, there is the danger of smeared colors. To avoid smearing, draw the lines on one side of the acetate and the colored areas on the other side.

Too much detail or too much verbal material on a transparency is confusing to the viewer. Determine what is important and eliminate unnecessary detail or verbal material. Deal with only one idea at a time. It is better to make several transparencies on a subject than to overburden one transparency.

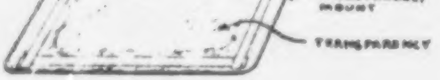
A good way to develop the design is to work out the transparency on a sheet of 8-1/2-by-11-inch paper. Place the acetate over the paper and trace the material on the transparency. If an illustration that you want to use is too small, it can be enlarged using the opaque projector. (See Section 5, "Enlarging and Reducing Drawings.")

Every transparency should carry a short title or caption identifying the subject of the transparency. The position of the title is important. On overhead transparencies, it should be placed at the top of the illustration where it will be easily seen by all viewers. Lettering should be no less than 1/4-inch high. Plain lettering is preferable because it is easy to produce and to read. Check spellings carefully. It is easy to misspell a word during production and most embarrassing when the class discovers it.

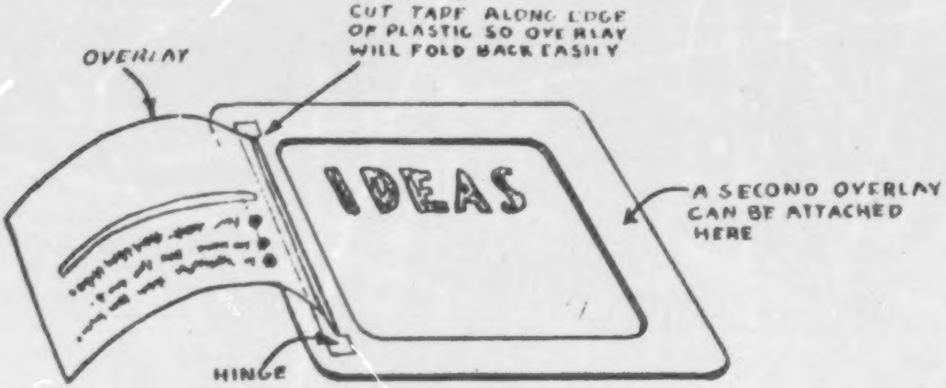
Mounting Transparencies and Overlays

Overhead transparencies can be designed to be used in a number of ways. Portions of the transparency can be progressively flipped on the screen to build an idea or concept, or part of the transparency can be covered for disclosure at the time the presentor wishes. The proper mounting of transparencies, overlays, and disclosure devices takes a little care and, where special effects are desired, a little ingenuity.

The base transparency is attached to the back of the mount. Overlays are hinged to the front of the mount. Note that the tape is applied to the reverse side of the transparency. Tape the long sides first and then the ends.

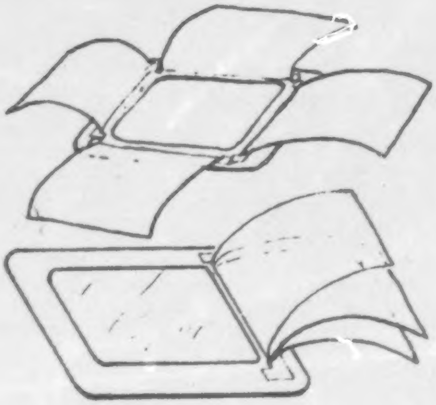


Attach the overlays to the front side of the mount. Position each overlay so that it is in proper register and tape one end to the mount as shown in the illustration below.

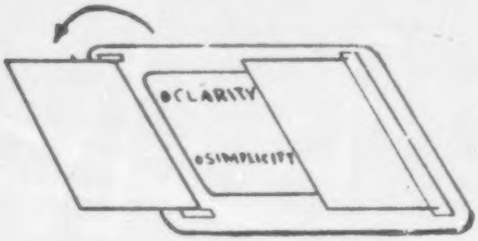

CUT TAPE ALONG EDGE OF PLASTIC SO OVERLAY WILL FOLD BACK EASILY
OVERLAY
IDEAS
A SECOND OVERLAY CAN BE ATTACHED HERE
HINGE

Additional overlays can be added to the top and bottom edges of the mount.

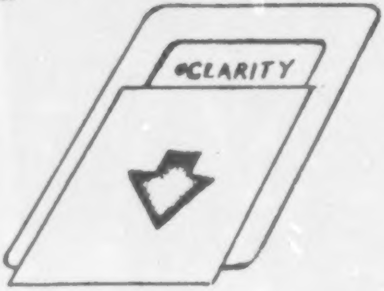
Some transparency users prefer to mount all overlays on either the right- or left-hand side of the mount so that all materials are moved into place from one side. This technique works only when the material is always presented in the same sequence.



"Disclosure" is a device that adds interest to transparency presentations because material is disclosed to the viewer as it is needed to make a point. Hinged flaps, sliding covers, and hinged sequential disclosure covers are easy to prepare, requiring only tape, cardboard, and cutting tools.


CLARITY
SIMPLICITY

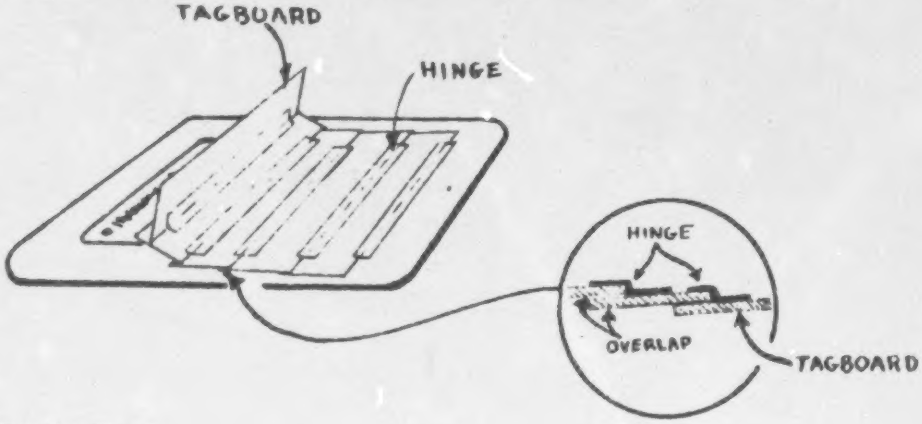
HINGED FLAP



SLIDING COVER

Use heavy tag board for the flaps. A sheet of paper or tag board provides a satisfactory sliding cover.

Progressive disclosure covers hinged with tape permit accurate, multiple disclosures on a single transparency. These covers are easily constructed with tagboard and tape. Each section of the tagboard cover overlaps the next portion of the cover slightly so that no light shows through. Because the hinges operate independently, there is little danger of lifting the next cover prematurely.



Mounting Tapes

Most pressure sensitive tapes can be used to attach transparencies and overlays to mounts, but some work better than others. Perhaps the least acceptable tape for this purpose is the familiar transparent tape. In a short time transparent tapes become brittle and easily break or tear. In addition, the adhesive tends to "bleed" from the tape and may stick to other transparencies or overlays. White freezer tape adheres well, does not get brittle, and does not bleed adhesive. One-half inch tape is satisfactory for mounting base transparencies. Three-quarter inch tape should be used for hinging overlays and disclosure devices.

314 - 340

Module: Operation of Audiovisual Equipment

Department/Context: Educational Media & Technology/Educational Technology

Subject/Topic: Instructional Media & Mediated Instruction/Utilization of Instructional Materials

Title: Audiovisual Equipment Operation

Prerequisite(s): None

Rationale: Traditionally, students have been expected to sit passively while a stream of teacher verbage flowed around them. The teacher's task was to sustain the flow of golden words, and it was the student's task to catch what nuggets he was able, as they flowed past. Today, the student still has responsibility for learning, but few teachers regard merely expounding as sufficient, and most of them agree that student success is also a responsibility of both the teacher and the instructional program. With this has come the understanding that individual students learning needs differ, and that different learning tasks may require quite different methods of teaching. Today, the search for alternative ways of teaching and learning occupy a large percentage of the teacher's time.

Educational media have opened up a vast range of alternative ways of teaching and learning. There presently exists a tremendous storehouse of potentially effective instructional materials trapped in the form of films, audio tapes, videotapes, filmstrips, transparencies, slides, and in the other media. Obviously, teachers cannot take advantage of these instructional materials if they lack the skills or the confidence to operate the equipment through which the various media may be presented.

This module of instruction is designed to provide students with the skills and confidence needed to successfully operate the basic pieces of audiovisual equipment.

General Objectives: To develop the necessary knowledge and skill in the operation of the basic audiovisual equipment.

Enabling Objectives:

1. Given a Bell and Howell 16mm manual load film projector the learner will be able to, within 6 minutes, show and rewind a 2 minute film adjusting the focus, framer and elevation controls, without error.

2. Given a Bell and Howell 16mm Auto-load film projector the learner will be able to, within 5 minutes, show and rewind a 2 minute film adjusting the focus, framer and elevation controls such that the image is suitable for instructional purposes, without error.

3. Given a Kodak Carousel slide projector, within 5 minutes the learner will insert 5 slides in the tray and project a properly orientated image using forward, reverse and focus controls located on the machine and on the remote unit, without error.

4. Given a Wollensak 1500 tape recorder, within 3 minutes the student will record and play back 15 seconds of his voice such that the recording is legible for normal listening, without error.

5. Given a viewlex V-25 filmstrip projector, within 4 minutes the learner will insert the filmstrip element and project 3 frames using the focus, elevation, framer and cool controls and achieving an image of sufficient clarity for instructional use, without error.

6. Given an opaque projector and suitable copy, within one minute the learner will project the copy on a screen using the focus, elevation and pointer controls such that it would be suitable for large group presentation, without error.

7. Given an overhead projector and a suitable transparency, within one minute the learner will project an image on a screen using the focus and elevation controls such that the image would be suitable for large group viewing, without error.

8. Given a Viewlex V-25 filmstrip projector, within 4 minutes the learner will insert the slide element and project 3 slides using the focus, elevation, framer and cool controls and achieving an image of sufficient clarity to be suitable for instructional use, without error.

9. Given a Technicolor 8mm film loop project within 5 minutes the learner will insert film cartridge, run, focus, frame, and remove cartridge from projector, without error.

10. Given an open reel helical scan videotape recorder deck, to thread playback, and rewind the videotape, such that the image on the monitor is suitable for instructional use, without error.

11. Given any of the basic pieces of audiovisual equipment using either light source lamps, or sound lamps, to be able to remove a defective lamp, and install a working lamp within four minutes, without error.

12. Given any of the basic pieces of audiovisual equipment whose controls are not in correct adjustment, as illustrated by the performance checklist to correctly adjust the audiovisual equipment within two minutes, without error.

13. Given a randomly ordered set of audiovisual operation problems, and a set of alternative solutions, to correctly match the problem with an appropriate solution, with less than 10% error.

Pre-Assessment: A cognitive and psychomotor pretest are available for this module. In cases of previous experience competency may be demonstrated by achieving a 90% criterion level on the cognitive pre-test and 100% competency on the psychomotor pretest.

The cognitive pretest is available in the testing lab, UH 208 and the psychomotor pretest may be taken in the media lab of Carlson Library.

Instructional Procedures:

1. Take the cognitive pretest (objective 13) for this module in UH 208. If competence is mastered proceed to the media lab in Carlson Library and demonstrate objectives 1-12 to the lab assistant. Should these objectives be mastered proceed to the next module, otherwise enter the instructional sequence where necessary to meet the module's criteria.

2. View the slide/tape: Introduction to AV Equipment. This program is available in either Carlson Library or in the self-instructional laboratory in UH 206. Review objectives 1 and 2 of this module and recycle, if necessary, the above program until you feel competent in meeting the stated criteria.

3. At this time the learner may elect to take the cognitive posttest for this module on objective 13. The posttest is located in UH 208. However, it has been noted that performance of the balance of the objectives contributes to the effectiveness of the slide/tape related to objectives 1 and 2 and to success on the cognitive posttest Therefore the student may elect to postpone the cognitive post-test until completion of the psychomotor posttest

4. For the balance of the performance objectives (no slide/tape for video tape recorder) the following procedure is appropriate:

    a. Study the module objective related to the equipment being examined.

    b. Secure and view the slide/tape related to that specific piece of equipment.

    c. Practice operation of the equipment until you feel you have mastered the objective.

    d. Arrange to take the performance post-test for each piece of equipment. This posttest may not be taken sooner than the next day after practice on the equipment, and must be taken in the Media Lab at Carlson Library.

    e. Repeat the above procedure until objectives 1 - 12 have been mastered.

Post Assessment: See Enabling Objectives and objective Checklist.

Check list

	NC	MC
Objective 1. Bell & Howell 16mm Projector		
a. proper threading techniques		
b. project film, making necessary adjustments for viewing (i.e., avoid keystone effect; maximum use of screen space)		
c. proper adjustment of focus		
d. proper frame adjustment		
e. proper elevation adjustment		
f. proper rewind technique		
g. within 6 minute time limit		
Objective 2. Bell & Howell 16mm Autoload Projector		
a. proper loading technique		
b. project film, making necessary adjustments for viewing (i.e., avoid keystone effect; maximum use of screen space)		
c. proper adjustment of focus		
d. proper frame adjustment		
e. proper elevation adjustment		
f. proper rewind technique		
g. within 5 minute time limit		
Objective 3. Kodak Carousel Slide Projector		
a. Insertion of slides for properly oriented image		
b. properly advances and reversed slides		
c. properly adjusts focus		
d. within 5 minute limit		
Objective 4. Wollensak 1500 Tape Recorder		
a. proper threading		
b. proper recording technique (including adjustment of controls)		
c. proper rewind		
d. proper playback (audible & distinct)		
e. within 3 minute limit		

			NC	MC
Objective	5.	Wollensak 1500 Tape Recorder		
	a.	proper threading		
	b.	proper hardware connections		
	c.	proper control adjustment for headsets		
	d.	within 5 minute limit		
Objective	6.	Viewlex V-25 Filmstrip/slide Projector		
	a.	proper insertion of filmstrip element		
	b.	proper focus		
	c.	proper elevation		
	d.	proper framing		
	e.	proper use of cooling control (30 seconds)		
	f.	within 4 minute limit		
Objective	7.	Viewlex V-25 Filmstrip/slide Projector		
	a.	proper insertion of slide element		
	b.	proper projection techniques (avoid keystone effect; maximum use of screen space)		
	c.	properly oriented image		
	d.	proper focus adjustments		
	e.	proper elevation adjustments		
	f.	proper framing adjustments		
	g.	proper cooling adjustments		
	h.	within 4 minute limit		
Objective	8.	Opaque		
	a.	Proper loading technique		
	b.	project copy for proper viewing (avoid keystone effect; maximum use of screen space)		
	c.	proper use of focus control		
	d.	proper use of elevation control		
	e.	proper use of pointer control		
	f.	within 2 minute limit		
Objective	9.	Overhead		
	a.	proper positioning of transparency		
	b.	project image for proper viewing (avoid keystone effect; maximum use of screen space)		
	c.	proper focus adjustment		
	d.	proper elevation adjustment		
	e.	within 1 minute limit		

	NC	MC
Objective 10. 8mm Film loop		
a. proper insertion of cartridge		
b. proper projection techniques (avoid keystone effect; maximum use of screen space)		
c. proper focus adjustment		
d. proper framing adjustment		
e. proper elevation adjustment		
f. removal of cartridge		
g. within 5 minute limit		
Objective 11. Videotape Recorder Playback		
a. proper threading technique		
b. proper playback technique		
c. proper rewind technique		
d. proper adjustment of monitor controls		
e. within 5 minute limit		
Objective 12. 16mm, Viewlex V-25 filmstrip, or Overhead		
a. proper safety precautions exercised in bulb removal		
b. proper installation techniques		
c. within 4 minute limit		

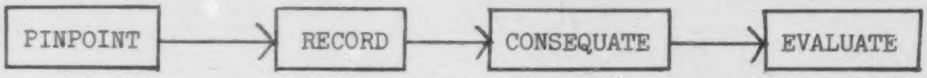
Context:

Major Subject Area:

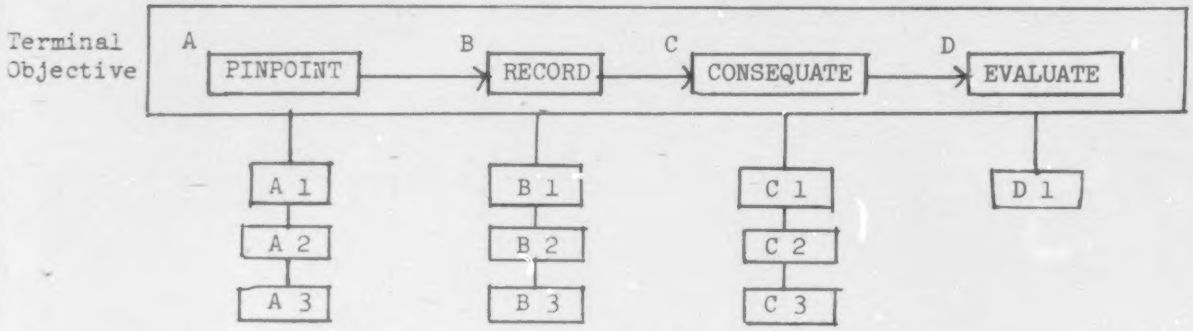
Title: Behavior Modification in the Classroom

Rationale: There is enough known about the general principles of learning to apply them in classrooms. This is being done under the broad umbrella of what is known as the systems approach to education. Related to this movement is the management of classroom behavior by positive means. Instead of threatening or punishing students to do what you want, the techniques to be taught in this module will enable teachers to create a classroom environment where students will behave appropriately (both instructionally and socially) because they want to.

Behavioral Objectives: The behavioral objectives for this module were generated by task analyzing the terminal objective. The terminal objective states that the student will be able to apply a process model of behavior change to a classroom situation. The model includes the following four processes.



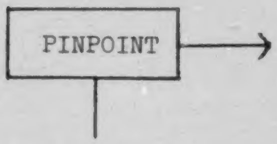
Before a student could be able to apply each step of the process, it was hypothesized that he would have to be able to demonstrate certain prerequisite behaviors. The structure below represents the complete task analysis. The objectives that go into each box follow.



Terminal Objectives: Given a classroom situation, design a plan for changing the behavior of a student or students. Structure your plan according to the following model: I-Pinpoint, II-Record, III-Consequate, and IV-Evaluate. See Criteria for Terminal Objectives on page 4.

PINPOINT OBJECTIVES

I



A1. Given a simulated or actual classroom situation, list at least 5 behaviors that you would want to change. If you want to remove an undesirable behavior, indicate a positive behavior that you might want to occur in place of the negative behavior. (See Criteria for concepts.)

A2. Given a simulation of a classroom situation or a case study, the student will list 5 behaviors, 5 related inferences and 5 related value judgements, 4 out of each set of 5 must be correct. (See Criteria for concepts)

A3. Given a list of behaviors, inferences and value judgements, the student will correctly label each. 90% accuracy.

II

RECORD OBJECTIVES

B1. Given a simulated classroom situation and a pinpointed behavior,

1. Select either an item sampling or time sampling method or recording behavior.

2. Explain why you chose that method including in your answer if the behavior is discrete or not and what that has to do with your choice and how frequently the behavior occurs and what that has to do with your choice,

3. Actually record the behavior.

B2. Given a list of 10 brief descriptions of pinpointed behaviors, match each with the appropriate recording method, 80% correct.

B3. Given a set of 10 descriptions of recorded behavior, indicate if the behavior was recorded by item sampling or time sampling, 90% correct.

CONSEQUATE OBJECTIVES

III → CONSEQUATE →

C1. Given a pinpoint and a record, select and describe the consequate that you would use to change the behavior. Include the type of reinforcement, the schedule and the specific method or methods that you will use to change the environment in order to change the behavior. (See Criteria for concepts.)

C2. Given a pinpoint and record, illustrate with an example how you would use each of the following concepts. (See Criteria for concepts.)

positive reinforcement
negative reinforcement
punishment
fixed ratio schedule
fixed interval schedule
variable ratio schedule
variable interval schedule
modeling
shaping
extinction
time out
counter conditioning
stimulus satiation

C3. Be able to identify examples of the following concepts given a simulated classroom situation by choosing the appropriate alternative on a multiple choice test, 95% correct.

positive reinforcement
negative reinforcement
punishment
fixed ratio schedule
fixed interval schedule
variable ratio schedule
variable interval schedule
modeling
shaping
extinction
time out
counter conditioning
stimulus satiation

EVALUATE OBJECTIVES

IV → EVALUATE

D1. Given a pinpoint, record, consequate and evaluate:

1. Compare the evaluation with the baserate.

2. State if the goal has been reached or not.

3. State recommendations for

    a. changing the pinpoint or;

    b. changing the record or;

    c. changing the consequate or;

    d. any combination of the above.

Criteria for Terminal Objective: In order for the plan for behavior change to satisfy the intent of the objective it must meet the following criteria:

A. Pinpoint

    1. The pinpointed behavior(s) must meet the ABCD criteria for a well stated objective. (See Criteria for concepts.)

B. Record

    1. The student must select either an item sampling or time sampling method of recording for observing the pinpointed behavior(s).

    2. The student must explain the choice of recording method and include in the explanation reference to the discrete or nondiscrete nature of the behavior)s) and a statement as to the expected frequency of the behavior(s). (See Criteria for concepts.)

    3. Results of observations must be presented in a graph.

    4. There must be at least 3 separate observation periods of at least 20 minutes in length.

C. Consequate

At this point the student must specify exactly how the environment was manipulated to effect the appropriate behavior change. This will include:

1. Type of reinforcement.

2. Schedule of reinforcement.

3. Specific reinforcers used.

The criteria for approrriate use of these techniques will be the same as those listed under the Concepts Related to Consequate.

D. Evaluate

The evaluation of the behavior change program must include:

1. Observations similar to those which established the base rate in RECORD.
2. Observations which are at least as comprehensive as those in RECORD.
3. A comparison of evaluation with base rate.
4. A statement as to whether the pinpointed objective was attained or not.
5. Recommendations for changing:
    a. pinpoint.
    b. record.
    c. consequate.
    d. or any combination of the above.

Criteria for Application of Concepts: When you are asked to generate your own examples of the following concepts, be sure to include the criteria listed under each concept.

A. Concepts Related to Pinpoint

1. Behavior.
    a. responces that are directly observable and measurable.
2. Inference.
    a. a statement which hypothesizes a causal or correlational relationship.
3. Value judgment.
    a. a statement which assesses the worth of something.
4. ABCD
    a. A = audience. Whose behavior is supposed to be changed.
    b. B = behavior. Specify responses which are directly observable or measurable.
    c. C = conditions. In what situation do you want the behavior to occur.

d. D = degree. The extent to which you want the behavior to occur. Acceptable performance level.

B. Concepts Related to Record.

1. Item sampling method of recording.

a. how often (number of times) a behavior occurs in a given time.

2. Time sampling method.

a. the percentage of time a behavior is exhibited in a given time.

C. Concepts Related to Consequate.

1. Positive reinforcement

a. a stimulus that

b. increases the probability that a response will occur if the reinforcement follows immediately.

2. Negative reinforcement.

a. a stimulus that

b. increases the probability that a response will occur if a punishing situation is removed.

3. Punishment.

a. a stimulus which decreases that rate of the behavior which it follows. The stimulus is considered undesirable by the learner.

4. Fixed ratio schedule.

Reinforcement is presented after a given and fixed number of responses.

5. Fixed interval.

Reinforcement is presented after a given and fixed interval if the response occurs at least once within that interval.

6. Variable ratio.

Reinforcement is presented after a varied number of responses. The number of varied responses is an average of a number of fixed responses.

7. Variable interval.

   Reinforcement is presented after different intervals of time. The amount of time after a reinforcement is presented is an average of a number of fixed intervals. It is necessary that a response be made in the interval in order for reinforcement to occur.

8. Modeling.

   A person who is in some way attractive to the learner, exhibits the desirable behavior and is reinforced for it. This must occur in the presence of the learner.

9. Shaping.

   The behavior to be learned is broken down into small steps, the smallest piece of behavior being something that the learner can presently do. He is reinforced for this step and is then required to do slightly more and is reinforced for that behavior. Each time the behavior is made more complex, it should be reinforced for each additional step. If the learner cannot exhibit a behavior in the sequence, it might be assumed that the expected behavior is too complex and the step that the learner was required to make was too big, and less complex behavior should be asked of him.

10. Extinction.

    A method of removing an undesirable behavior by identifying the reinforcement and removing it.

11. Time out.

    A method of removing an undesirable behavior in which the learner is taken out of the stimulus situation when he exhibits the related undesirable response.

12. Counter conditioning.

    A method of decreasing a behavior. A behavior which is incompatable with the behavior to be decreased is reinforced so that it will occur at the same time and instead of the undesirable behavior.

13. Stimulus satiation.

    Used when a behavior is to be decreased. The behavior has to occur frequently. Large quantities of reinforcement are provided each time the behavior is emitted. Probably the stimulus situation will be made to occur more frequently than would be expected by leaving the behavior occur as it presently is occurring.

COMPETENCY-BASED TEACHER EDUCATION

ON BECOMING A TEACHER OF THE "NEW" SOCIAL STUDIES

SECONDARY EDUCATION 340

JAMES R. JOHNSON

THE UNIVERSITY OF TOLEDO

Department: Secondary Education

Course: 340

Title: On Becoming a Teacher of the New Social Studies

Overview and Rationale: As you contemplate becoming a "Social Studies teacher," it is perhaps useful to reflect upon your experiences and associations developed through twelve years of learning with such teachers. Having shared such a common experience you might expect that people could easily agree on such matters as what Social Studies actually is, as what Social Studies teachers do, and as what kinds of objectives should buttress a Social Studies curriculum. Strangely enough, no such concensus has been achieved. The term "Social Studies" has persisted in our curriculum for more than fifty years, yet scholars, teachers, students and the public still experience some difficulty in defining the term or even agreeing whether Social Studies should be taught at all. Considering this situation it seems imperative that new teachers begin to deal with the persistent issues and controversies which color their chosen field. Beyond this point, however, it appears even more imperative that Social Studies teachers, all teachers, be called upon to describe their professional role perceptions and expectations as well as to provide a sound rationale for the existence of their individual subject matter competencies within the public school curriculum.

As a result of these concerns, the following module has been designed to assist you in formulating answers within your immediate frame of reference to the following kinds of questions:

1. What are "the Social Studies?"
2. What is meant by "the new Social Studies?"
3. How are the "new Social Studies" different from "the old Social Studies?"
4. How do the Social Studies differ from the social sciences?
5. What behaviors should be characteristic of a Social Studies teacher?
6. Why have we historically elected to have the Social Studies taught at every grade level, K-12? Should it continue to be taught in this manner?
7. What kinds of objectives and experiences should a Social Studies classroom seek to provide?

The ability to answer the above questions will constitute the objectives identified for the module. In this module you will have the opportunity to select from a wide variety of readings, media, and classroom experiences in order to attain the competencies specified in the objectives. You are encouraged to select those educational experiences which you believe will be of most assistance to you. It may be possible to complete the requirements for this module without attending the regularly scheduled class meetings. While you are free to pursue the objectives of this unit using independent study strategies, you must be cautioned that the topics considered in each class period will not be repeated if you elect not to attend class. All materials suggested for use in this module will be stored and open for circulation in the Curriculum Materials Center. You are encouraged to pursue the objectives of this unit with a friend or several other class members if this strategy appears to afford a useful learning opportunity for you.

Prerequisite Modules: None. (This is the introductory module of the Social Studies Methods Component of Secondary Education 340.)

Objectives and Competencies:

1. Given selected readings, audiotapes, class discussion and interviews with students and teachers, the pre-service social studies teacher will be able to write and/or orally describe what is meant by "the Social Studies" in the public school curriculum. The pre-service teacher will explain the sources of his definition in a paper of not more than 200 words or in an oral description of equivalent length.

2. Given selected readings, audiotapes, class discussion and teacher interviews, the pre-service social studies teacher will be able to contrast the "new Social Studies" with more traditional approaches to teaching Social Studies. The pre-service teacher will contrast both positions in a short paper (200 words) or oral presentation. He will illustrate two points of contrast by referring to learning materials reflecting each position.

3. Given selected readings and class discussion the pre-service social studies teacher will be able to list three characteristics of "the social sciences" and three characteristics of "the Social Studies." The pre-service teacher will also be able to identify one example of the "new Social Studies" curricula which is interdisciplinary (teaching separate social science disciplines) and one which is multidisciplinary (teaching a course which draws concepts from each of the several social sciences).

4. Given selected readings, selected social studies learning materials, class discussion and teacher interviews, the pre-service social studies teacher will develop a rating scale or check list which an administrator might use to identify a good (your definition) social studies teacher. (You are encouraged to meet this competency as a small group project.)

5. Given selected readings and class discussion, the pre-service social studies teacher will be able to write a letter to the editor of a local newspaper in which he reacts to a recent

article which urges that social studies be eliminated from the public school curriculum. The article asserted, "Social studies classrooms are increasingly suspect as to making any useful contribution which could possibly help young people become better citizens or assist them in leading more fulfilling adult lives. The entire curriculum, which insistently dwells on the past and upon learning obscure trivia or no utility, is largely irrelevant. Students frequently learn more about 'social living' on the streets and playgrounds than they do in the classroom."

6. Given selected readings, class discussions and interviews with area teachers and students, the pre-service social studies teacher will, working in groups of five students, develop five general goals for the social studies program, grades 7-12. The group should arrive at a concensus and list the goals in order of importance. Under each goal the pre-service teacher should explain or justify his choice and suggest two kinds of learning activities appropriate to the secondary social studies classroom which might help develop each goal.

7. Given the learning activities of the module, the pre-service social studies teacher will locate one lesson taught in a secondary social studies classroom which is most congruent with his concept of the following elements of instruction: (a) teacher role, (b) student role, (c) relevance of objectives and content. The pre-service teacher will discuss each area in a short paper (300 words). He will specifically refer to the model lesson he describes.

Instructional Procedures and Materials:

1. What are "the Social Studies?"

   A. Read: "The Curriculum Revolution." In E. Fenton, The New Social Studies. New York: Holt, Rinehart & Winston, 1967. Pp. 1-5.

   B. Read and discuss the positions presented in "What is Social Studies? (See Appendix reading #1)" In D. J. Skeel (Ed.), The Challenge of Teaching Social Studies in the Elementary School: A Book of Readings. Pacific Palisades, Calif,: Goodyear Publishing Co., 1972. Pp. 1-2.

   C. Listen: Audiotape lecture #1 - a round table discussion among your instructors reacting to the question of "What is Social Studies?"

   D. Read: "Social Studies: The Need for Redefinition," by J. P. Shaver. Social Education (November, 1967), pp. 588-592.

   E. Read: "Defining the Social Studies: An Exploration of Three Traditions," by J. L. Barth and S. M. Shermis. Social Education (November, 1970), 34, pp. 743-751.

F. Interview the following and then respond to the question "What are the Social Studies?" As you formulate an answer to the question, be certain to rely *only* upon interview data: two elementary school children of different ages, a junior high school student, a senior high school student, a secondary social studies teacher, and your mother. Ask each individual to define the social studies.

G. Select four social studies textbooks at random from the CMC. Analyze the table of contents and skim each book. Then write a definition of the social studies using the textbooks as your *only* data source. How does this definition compare with that generated in the above readings or that formulated as a result of interviews?

H. Class: Group discussions addressed to the question.

I. Analyze photo set number 1. Describe social studies using the photos as your data source.

2. What is meant by "the New Social Studies?"

A. *Read*: "Baboons, Boundaries and Bassoons," by D. McCafferty. *Media and Methods*, 6, pp. 51-52, 1970.

B. *Examine and skim*: *Exemplars for the New Social Studies* by F. L. Ryan. Englewood Cliffs, N. J.: Prentice-Hall, 1971.

C. *Examine and skim*: *The New Social Studies* by E. Fenton. New York: Holt, Rinehart, & Winston, 1967.

or

Teaching the New Social Studies in the Secondary School by E. Fenton. New York: Holt, Rinehart & Winston, 1966.

or

Inquiry in the Social Studies by B. G. Massialas and B. Cox. New York; John Wiley, 1966.

D. *Listen*: Audiotape lecture #2 - "The new social studies: process learning"

E. *Class*: A laboratory session presenting and discussing various "new social studies" curricular materials.

F. *Class*: Discussion of teacher and student behaviors in the "new social studies." Analysis of behaviors in a demonstration lesson conducted in the classroom or using one of the Fenton films.

G. Read: "A Critical Appraisal of Twenty-six National Social Studies Projects," by N. M. Sanders and M. L. Tanck. Social Education, 34, April, 1970. (entire issue)

and/or

H. "Evaluation of Curricular Projects, Programs, and Materials," by K. Wiley and I. Morrissett. Social Education, 36, November, 1972.

I. Visit: a local social studies classroom in which some of the "new social studies" materials are being used or field tested. Discuss these materials with both teachers and students. What do they think? Were you able to observe anything "new?"

3. How are the "new Social Studies" different from the old Social Studies?

A. Examine: several social studies methods textbooks which are copyrighted prior to 1960. (If you experience difficulty, consult your instructor for suggestions.) Using the books as a data source, jot down the first ten words or phrases which come to mind in reaction to the "social studies" curriculum implied by the data.

B. Repeat the above assignment using several methods texts which purport to deal with the "new social studies" methods. See your instructor for suggestions. Include the books required for this course. How do your word impressions compare?

C. Examine: several randomly selected social studies textbooks which have been designed for use in the secondary schools. Only select those which have a first copyright since 1965. Would you classify these materials as representative of the "new" or traditional approaches to social studies? Be specific in justifying your decision. (This activity may well be pursued as a group enterprise.)

D. Class: a laboratory lecture session in which selected "new" methods and materials are presented, discussed, and able to be examined by students.

E. Read: the entire November, 1972 issue of Social Education if you haven't done so. This journal reviews 26 major social studies curriculum projects which have generated materials for use in the schools. It is the best means of becoming familiar with what is happening in curriculum development in social studies.

4. How do the social studies differ from the social sciences?

   A. Read: "The Social Studies versus the Social Sciences," by E. S. Johnson. In R. E. Gross, W. E. McPhie, and J. R. Fraenkel (Eds.), Teaching the Social Studies. Scranton, Pennsylvania: Intext, 1969. Pp. 8-18.

   B. Read: "A Discipline for the Social Studies," by S. P. McCutchen. In M. Feldman and E. Seifman (Eds.), The Social Studies: Models, Structure, & Strategies. Englewood Cliffs, New Jersey: Prentice-Hall, 1969. Pp. 200-206.

   C. Class: lecture-discussion on how the social sciences are utilized in social studies classrooms. Students will identify concepts drawn from each discipline which they believe should be incorporated into every social studies classroom curriculum.

   D. Read: "Social Studies Education". In W. Beckner and J. Cornett, The Secondary School Curriculum. Scranton, Pennsylvania: Intext, 1972. Pp. 245-260.

   E. Read: "Exploring the Meaning of Social Studies," by S. H. Engle. Social Education, 35 (March, 1971) 380-88, 344.

   F. Read and discuss in small groups: "Structure in Social Sciences and Implications for the Social Studies Program," by A. A. Bellack. In W. E. Gardner and F. A. Johnson (Eds.), Social Studies in the Secondary School. New York: Allyn and Bacon, 1970. Pp. 99-112.

5. What behaviors should be characteristic of a "new" social studies teacher? Of a "new" social studies student?

   A. Read and discuss in small groups: Appendix insert #2 - "What Can Man Become?" by A. W. Combs. In "Will the real teacher please stand up?, edited by M. Greer and B. Rubenstein. Pacific Palisades, California: Goodyear Publishing Co., 1972. Pp. xxiii.

      Discuss the kinds of teacher behaviors and possible social studies objectives implied by Combs article.

   B. Look: at the student pictured on pages 16-17 of Will the real teacher please stand up? Also study the students pictured on the following pages of Teaching about Life in the City[1]; xii, 8, 15, 33, 52, 54, 55, 58-60. Examine the pictures in Photo set #1. Having studied these young people react to the following questions individually or as a member of a group:

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[1] Wisniewski, R. (Ed.) Teaching About Life in the City. 42nd NCSS Yearbook. Washington, D.C. NCSS, 1972.

1. What might these young people realistically expect from a "new" social studies classroom teacher?

2. Are the expectations and *social* needs of these youngsters substantially different?

3. What kinds of behaviors might a teacher expect from these youngsters as they enter the classroom?

C. *Class*: as a class analyze visuals and videotapes or films of young people and teachers in social studies classes. Discuss the socio-emotional climate created by the teacher.

D. *Visit* a local open classroom (or look at a videotape supplied by your instructor) and compare the student and teacher behaviors with those found in a more conventional setting.

E. *Read*: "My personal experience," by C. Ketter. In M. Greer and B. Rubenstein (Eds.), *Will the real teacher please stand up*? Pacific Palisades, California: Goodyear Publishing Co., 1972. Pp. 29-30. (*See appendix insert #3*.)

Discuss the article with another student and answer the following:

1. What kind of social studies experience would have been relevant for Calvin?

2. If the experience had been relevant for Calvin, would it have alienated his classmates? If so, what choices are open to Calvin and his teacher?

F. *Class*: In group discussion reflect upon the following questions:

1. What real barriers exist preventing change in social studies teachers behavior? In the social studies curricula?

2. Which barriers are merely excuses?

G. *Read*: "Reach, Touch and Teach" by Terry Borton. In M. Greer & B. Rubenstein (Eds.), *Will the real teacher please stand up*? Pacific Palisades, California: Goodyear Publishing Co., 1972. Pp. 40-44.

React to the following questions?

1. What kind of social studies education would Borton support?

2. What kinds of activities might you expect to find in his American history class? Describe one.

6. Why have we elected to teach social studies at each grade, K-12? Should we continue to do this?

   A. *Read*: Chapter one of the 39th NCSS Yearbook. In D. F. McClure (Ed.), *Social Studies Curriculum Development*: *Problems and Prospects*. Washington, D. C.: NCSS, 1968. Pp. 1-33.

   B. *Read and take notes*: "Social Studies Curriculum Guidelines," by G. Manson, G. Marker, A. Ochoa, & J. Tucker. *Social Education*, (December, 1971) Pp. 853-868.

   C. *Read*: "Revising the Social Studies, What is Needed?" by P. R. Hanna. In E. Seifman and M. Feldman, (Ed.) *The Social Studies*. Englewood Cliffs, New Jersey: Prentice-Hall, 1969. Pp. 207-216.

   D. *Review*: November, 1972 issue of *Social Education* which discusses and evaluates 26 social studies curriculum projects.

   E. *Class*: discuss question and examine several K-12 plans of scope and sequence now in use.

   F. Group discussion on relevance in social studies curricula.

7. What kinds of objectives are suitable for the "new" social studies?

   A. Select one of the former reading on the "new social studies" which you haven't yet read.

   B. *Read* Chapter two of the 39th NCSS Yearbook. D. F. McClure *(Ed.)*, *Social Studies Curriculum Development*: *Problems and Prospects*. Washington D.C.: NCSS, 1968. Pp. 34-66.

   C. *Read*: "Social Studies," W. Beckner and J. Cornett, *The Secondary School Curriculum*. Scranton, Pennsylvania: Intext, 1972. Pp. 242-263.

   D. In a group of five students develop five general goals for social studies curricula at the secondary level upon which you can all agree. Then discuss several examples of how they might be implemented into the course of study at any secondary grade level, i.e. Grade 10 - World Cultures.

Assessment: See objectives and your course instructor for further clarification.

Department: Secondary Education

Course: 340 (Social Studies)

Title: Social Studies Intensive Unit Assignment

Rationale: As the terminal project in Sec. Ed. 340 we are asking you to pool the skills you've developed and acquired during the course in the preparation of an 'inquiry-oriented' within your subject matter field. This unit plan should involve a minimum of five class days to complete. It is anticipated that insofar as circumstances permit that you will be able to implement part of the unit in the school in which you've been placed for 340. For this reason it may be advisable to determine the nature of the content to be covered in your placement classroom during the second week in March. If you have unable to establish a relationship in which you would be able to field test a part of the unit with a group of young people, you may feel free to select any content area commonly taught within your discipline.

It should be pointed out that the plan we are requiring that you submit as the product of this TPO is more detailed and specific than you are likely to do when you have your own job in the public schools. We must require certain behaviors completed in writing on your part which you might otherwise complete mentally as a self-contained teacher. Unfortunately it is necessary in an assignment of this kind that you supply us tangible evidence of your intentions when you may be unable to teach the material or in a situation in which we may not be able to observe your teaching episode. An example of the kind of detail I'm referring to is that one of the objectives will require that you develop and discuss some plan for reinforcing student behaviors which you have found desirable. Ordinarily you would plan mentally for this and execute the attendant teacher behaviors as circumstances dictate. In this case, we will never be able to know that you can deal with the concept unless you furnish some evidence to us. Hence--the objective.

Prerequisite Modules: All modules should have been completed or in process before attempting "Intensive Unit." It is mandatory, however, that "Instructional Strategies Modules" be complete before initiating "Intensive Unit Assignment."

Objectives:

1. The student will be able to select a unit of content commonly taught in the public schools and appropriate to a specific grade level or course.

2. The student will be able to describe in a paragraph the important conditions of learning which will affect learning among the students in the group for which the unit was designed. The paragraph will describe population of students and any learning conditions in the school which must be accommodated as one plans to teach any lesson or unit.

3. The student will write a short paragraph discussing the importance and rationale for the unit and its objectives. This section should not exceed sixty words.

4. The student will state all objectives for the unit in behavioral terms using the ABCD format. Wherever possible he will identify a criterion performance level. A minimal requirement for this section will be at least five objectives following the ABCD format and using specific action verbs to identify the student behavior.

5. The student will list a minimum of five concepts to be learned or expanded during the course of the unit. Satisfactory performance of this task will be judged in terms of the appropriateness of the concepts, their relationship to the objectives and the degree to which the entire unit appears to offer an opportunity to learn the concept.

6. The student will list and describe the nature and use of two alternative springboards for inquiry. Wherever possible the springboard is to be included with the unit. The springboards will be judged in terms of their appropriateness given the stated objectives and in terms of their motivating potential given the audience to whom they are directed.

7. The student will list at least two data sources which he plans for use in the unit. Full bibliographic information is required for any media or other commercial material. Wherever circumstances permit--the data source itself should be permitted (such as several pages, a graph, letters, cartoons or the like). The data source will be judged with reference to the unit objectives, an awareness of the audience for whom it is meant and in terms of its appropriateness for the unit.

8. The student will list at least three hypotheses, relationships, and ideas which he expects the students to develop given the objectives and learning experiences in the unit. These will be evaluated in terms of content validity and with reference to their appropriateness given the audience with whom the unit is being developed.

9. The student will describe the treatment to be utilized in meeting the objectives associated with the unit. The treatment section will include the following items which may be arranged in any order deemed appropriate by the student:

   a. A description of the instructional activities associated with the unit. It is expected that the teacher will employ at least three different instructional strategies.
   b. Copies of any intended handouts or worksheets to be distributed.
   c. A list of any optional or independent study opportunities planned for the unit.

d. A list of at least ten questions which may be asked to develop the objectives and the concepts to be learned.

e. A list of any commercial materials which may be utilized with the unit. Full bibliographic data is required for all textbooks, supplementary readings, films, tapes, filmstrips, etc.

10. The student will submit a plan for evaluation of the total success of the unit. Minimal completion of this objective will be a test which assesses the learning required in the objectives. Other forms of evaluation are recommended and encouraged. The objective will be judged in terms of how closely the evaluation technique is matched to assessing the behavior required in the objectives of the unit. One must also assess the evaluation in terms of the potential skills of the designated audience. (An inner city junior high student with reading difficulties is not likely to be able to respond effectively to a test which is dominated by essay questions.)

11. The student will develop a plan for reinforcing students' acceptable behavior in such a manner as to promote an atmosphere conducive to meeting the unit objectives. In a paragraph or two the student will describe in specific terms what specific behaviors he plans to employ and what kinds of behaviors on his part he will try to avoid in teaching and interacting with students.

Instructional Procedures and Materials:

A. It is suggested that the students develop their intensive unit requirements to meet the behavioral objectives and following the outline listed below.

We would like the plan you submit to consist of the following components:

I. Title: A reference to the area of content being treated -- i.e., The Age of Discovery.

II. Audience: Statement about the group for whom the unit is intended -- i.e., 8th Grade American History for students below grade level in reading. Most of the young people are from Black families.

III. Overview and rationale: Short paragraph explanation about the nature of the unit. This part will explain why the unit is important for young people to learn.

IV. Objectives: Objectives should be behaviorally stated and should follow the ABCD format as nearly as possible. We recognize, however that certain behavioral objectives in the

Social Studies are difficult to formulate in terms of establishing a criterion performance level (i.e., 8 out of 10 correct in five minutes). A minimal requirement for each objective must be a precise, behavior oriented action verb. The objectives may be organized in any fashion you believe to be most convenient and useful. Some may prefer to list the objectives as TPO's and EO's. Others may wish to make no such distinction. Some may wish to list objectives, treatment and materials, and evaluation day by day while others may prefer to list all these parts as separate sections.

V. Concepts to be learned: Identify the key concepts which will be treated and stressed during the unit. Do not list concepts which you do not emphasize in the unit and materials selected. List at least five concepts for the unit.

VI. Springboards: List and describe at least two alternative springboards for inquiry which may be used with the unit. Where this is impossible, describe it in detail and explain how it will be used. You may wish to describe how the springboards will be used in the treatment section. In any case be certain that this feature is included.

VII. Data Sources: List at least two data sources which will be utilized in the unit. Include full bibliographic information when this is appropriate.

VIII. Hypotheses to be generated: List at least three hypotheses which you expect the students may be likely to develop in this unit. If you have trouble anticipating the hypotheses, list at least three ideas or relationships which you expect the students to develop during the course of the unit.

IX. Treatment: This component is composed of at least three parts. The student should feel free to arrange these in any fashion which he feels best communicates.

1. A description of the learning activities planned for the unit. Indicate what both teacher and pupil would be doing. Include any worksheets which you would distribute. Describe any "contracts", quests or other independent study activities which may be planned. Be certain that the activities directly relate to specific objectives. In parentheses after each activity place the number(s) of the objective to which it refers.

2. A list of questions which may be asked -- Remember that Inquiry requires that questions of high cognitive levels be asked. Your questions should help students to meet the objectives you've written and to learn the concepts you have identified.

3. Materials to be used: List any media which would be used in completion of the unit.

X. Evaluation: Develop an evaluation plan which will enable you to make some judgements about the total success of the unit. Include the test and an explanation of any other form of evaluation to be utilized. Remember that evaluation is more than an end of unit test. Consider how to evaluate the following: yourself, student reaction to the unit and learning experiences, students' affective growth (i.e., value clarification -- if your topic offers a possibility of growth in values).

XI. Reinforcement: Discuss briefly in a paragraph how you intend to monitor your instructional behaviors to establish an atmosphere conducive to inquiry. What kinds of things might you do or say which would encourage a student to respond more favorably to the learning situation. What kinds of behaviors would you guard against on your part as being inappropriate to your long range objectives?

Assessment: Students will submit a unit plan and an evaluation of their teaching experience according to the specifications suggested in the behavioral objectives.

Department: Secondary Education/Science

Course: 314:340

Title: Field Work and Field Trips in Science Courses

Rationale: In this module the pre-service student will be asked to consider: (1) motives for including field work and field trips, (2) alternative subject matter themes for field work and field trips, and (3) how to organize and conduct field experiences.

Prerequisite Modules: Behavioral Objectives

Terminal Performance Objectives:

A. Pre-service teachers will be able to defend orally or in a paragraph the rationale of including field experiences in the total science program and list 4 possible topics to be investigated in learning activities outside of the classroom.

B. Pre-service teachers will be able to design a field trip or field work unit appropriate for implementation in the classes of their participating schools.

Enabling Objectives:

1. Given 2 important sourcebooks (i.e., Creative Biology Teaching, A Sourcebook for the Biological Sciences, Laboratory and Field Studies in Biology, Teaching Science in Today's Secondary Schools) the pre-service student will organize a paragraph summarizing at least 3 major reasons for conducting field experiences of those considered in these books.

2. Given sourcebooks and class discussion the pre-service teachers will list ten topics that could be investigated in field work or field trips, at least 3 of which could be studied in an urban location.

3. When asked for a specific plan for field work or a field trip the pre-service student will include behavioral objectives in ABCD format.

4. When asked for a specific plan for a field experience the pre-service student will include an outline for preliminary planning indicating how and from whom permission will be sought, how students will be transported, and who will work with the students at the location of the field experience.

5. When asked for a specific plan for a field experience the pre-service student will include, (1) directions to the students outlining what they will do in the field work, or (2) an itinerary for the field trip.

a. Where field collecting is required the procedures will indicate how such collections will be made and limitations for collecting in the case of rare species that are protected by federal, state, or local restrictions.
b. Where identification of speciments is required the procedures will include the names of the taxonomic keys or reference books that will be needed.

6. When asked for a specific plan for field experience the pre-service student will include questions to be used for a discussion of information gathered in the field experience.

Preassessment: Same as postassessment.

Instructional Procedures:

1. Pre-service students will read Ch. 9, "Planning Field Trips" in Creative Biology Teaching by Harding, Volker, and Fagle, and/or "Field Experiences" in Teaching Science in Today's Secondary Schools by Thurber and Collete.

2. The class will discuss advantages and disadvantages of field experiences and possible topics to be investigated through field experiences in the various secondary school science disciplines.

3. The pre-service students will construct a model for planning field experiences in class using a specific topic chosen by the class.

Postassessment:

A. Synthesize responses to the following:
   1. Give three reasons for conducting learning activities outside of the classroom.
   2. List ten topics that could be investigated in field work or field trips, at least three of which can be studied in an urban location.

B. Submit a plan for field activity containing components which you think are essential for planning and conducting such learning activities.

Resources:

Walter A. Thurber and Alfred T. Collette, Teaching Science in Today's Secondary Schools, Allyn and Bacon, Inc., Boston. 1968.

Harding, Delma E., Volker, Roger P., and Fagle, David L., Creative Biology Teaching, The Iowa State University Press, Inc., Ames, Iowa. 1969

Department: Secondary Education/Science Education

Course: Secondary Education 340

Title: Laboratory Inquiry

Prerequisite Modules: The Nature of Inquiry Learning
Inquiry Teaching

Rationale: One of the most effective means of getting students to learn something is by developing within them an interest or a need to know what is to be learned. To arouse students interests in science, teachers should get them involved in laboratory experiments or activities in which they are confronted with a discrepant event or intellectual perplexity. By seeking information from their investigations students will be able to resolve the conflict within the limits of the data obtained.

Terminal Objective: The plan must include all of the following component parts:

1) pre-laboratory discussion
2) description of teacher roles
3) post-laboratory discussion
4) behaviorally stated student objectives using ABCD format
5) complete listing of all materials and supplies available to students
6) a list of all safety precautions to be observed.

Enabling Objectives:

1. Given an opportunity to study and examine two different student laboratory guides in a major science area, one representing a modern inquiry oriented curriculum and the other representing a traditional curriculum, the pre-service teacher will be able to describe the differences between the two types of laboratory activities. This activity requires the student to specify at least 3 points of difference.

2. Given an opportunity to examine the Teacher's Guide for a modern inquiry oriented secondary school curriculum the pre-service teacher will be able to discuss the function of laboratory activities in the instructional process. This task may be completed orally or in a short paper not exceeding 300 words.

3. Given an opportunity to plan an inquiry oriented laboratory activity, the pre-service teacher will include a pre-laboratory discussion. When asked to state the function of the pre-laboratory discussion, the pre-service teacher will be able to indicate its function.

4. When asked to describe the function of a teacher during an inquiry oriented laboratory activity, the pre-service teacher should be able to state the teacher's functions.

5. Given an opportunity to plan an inquiry oriented laboratory activity, the pre-service teacher will include a post-laboratory discussion. When asked to state the function of the post-laboratory discussion, the pre-service teacher will be able to do so.

6. Given an opportunity to plan an inquiry oriented laboratory, the pre-service teacher will include in the plan student objectives stated in behavioral terms (ABCD or Mager format).

7. Given an opportunity to plan an inquiry oriented laboratory, the pre-service teacher will state in the plan a complete listing of all supplies and materials that should be available to students during the laboratory activity, and will specifically identify any items that require special or advance preparation, i.e., preparation of solutions and obtaining of living organisms.

8. Given an opportunity to plan an inquiry oriented laboratory, the pre-service teacher will state all safety precautions to be observed during the student activity.

Preassessment

1. Examine copies of laboratory directions for either a,b,c, or d below:

   a. Investigating the Earth (ESCP), Haughton Mifflin and Laboratory Investigations in Earth Science, Silver Burdett Co.
   b. Biological Science: An Inquiry into Life (BSCS), Harcourt Brace Jovanovich and Modern Biology, Holt Rinehart and Winston
   c. Chemistry: Experimental Foundations (CHEM) Prentice Hall and Chemistry, Silver Burdett Co.
   d. The Project Physics Course (HPP), Holt Rinehart and Winston and Physics, Allyn and Bacon.

Describe the differences between the two types of laboratory activities observed.

2. Obtain and examine the Teacher's Guide for one of the following programs:

   a. Investigating the Earth (ESCP), Haughton Mifflin Co.
   b. Biological Science: An Inquiry into Life (BSCS), Harcourt, Brace, Jovanovich.
   c. Chemistry: Experimental Foundations (CHEM), Prentice-Hall.
   d. The Project Physics Course (HPP), Holt Rinehart and Winston.

Describe the function of the laboratory activities in the instructional program.

3. State the function of the pre-laboratory discussion in inquiry oriented laboratory activities.

4. State the fuction of a teacher in an inquiry oriented laboratory activity.

5. State the function of the post-laboratory discussion in an inquiry oriented laboratory activity.

6. Write two student objectives for an inquiry oriented laboratory activity.

7. Outline the items or components that should be included in a plan for an inquiry oriented laboratory.

Instructional Procedures:

1. Read Chapter 6, pgs. 89-109 in Teaching Science By Inquiry in the Secondary School by Robert Sund and Leslie Trowbridge, Charles E. Merrill, 1967.
2. Read pgs. 16-28 in Inquiry Techniques for Teaching Science by William Romey, Prentice-Hall, 1968.
3. Design an Inquiry Oriented Laboratory Investigation.

Post-assessment:

Same as preassessment.

Department/Context: Secondary Ed./Mathematics Methods

Subject: Comparing Text Materials

Title: Comparing Text Materials

Rationale: At the present time and probably for many years to come most secondary school mathematics teachers will depend on textbooks as their major teaching aids. In fact, in most classrooms the textbook is the primary source of objectives, curriculum sequence, material for individualing, etc. Therefore it is imperative that teachers learn to compare textbooks according to preselected criteria in order to find the one most appropriate for their needs.

Prerequisites: Instructional Strategies

Objective: Given a list of categories for comparison and two mathematics textbooks at the same level (grade) and discipline (subject), the student will compare the two books in each of the categories. The comparison in each category must be illustrated by examples from the texts.

Instructional Procedures:

1. The group of mathematics methods students will be divided into small groups, each of which will be given two mathematics textbooks for the same level and discipline, and after about 45 minutes report to the rest of the group its comparison of the two books.

2. Upon completion of the reports students will in a group discussion abstract from the reports the categories used in comparison texts and suggest other categories that would be useful.

Posttest

Use the following list of categories in making a comparison of the two texts provided to you by the instructor. Comparisons in each category must be illustrated by examples from the texts.

List of Categories.

1. Objectives (stated or implicit in the materials and treatment)

    a. content
    b. process

2. Mathematics

    a. Correctness
    b. Definitions
    c. Sequence
    d. Level of rigor and precision
    e. Symbolism (type and amount of)

3. Language

   a. Formal or informal
   b. Complex or simple sentences

4. Pedagogy

   a. Motivational springboards
   b. Provision for individualization
   c. Provision for exploration (discovery)
   d. Pretests and Posttests

5. Mastery

   a. Exercises above application level of Bloom's Taxonomy
   b. Remedial material
   c. Reviews

6. Enrichment

   a. Enrichment material provided in text
   b. References for independent study topics

7. Aids to Learning

   a. Teachers manual with suggestions for teaching
   b. Answer key
   c. Overhead projectors available
   d. Other components available

8. Physical Characteristics

   a. Openness (not crowded, large type, white space, etc.)
   b. Format (topic headings, exercise direction lines, exercise heading and color, important concepts stand out?)

Department/Context: Secondary/Major Methods

Topic: Evaluation in Mathematics

Title: Evaluation in Mathematics

Rationale: The majority of instruments for diagnosing student strengths and weaknesses and for evaluating student mastery of objectives are teacher-made tests. It is important therefore for teachers to be able to prepare evaluation instruments that exactly match their objectives. It is particularly important for teachers to be able to measure achievement of high level objectives, for otherwise most students knowing what to expect on tests will tend to concentrate on low level skills.

Objectives:

TPO 1. Given a set of objectives, the student will write an evaluation instrument for the objectives indicating which items of the instrument relate to each objective. The behavior required on a test item must be the behavior described in the related objective.

TPO 2. Given a set of objectives, an evaluation instrument for those objectives, and a completed answer sheet for a student, the major methods student will determine without error which of the objectives have been mastered by the student.

EO 1. Given a list of objectives matched with test items, the student will modify those items that do not properly measure mastery of the related objectives so that they do properly measure mastery of the objectives.

EO 2. The student will write two mathematics test items for each of the major levels of Bloom's Taxonomy.

Instructional Procedures and Materials:

1. Required reading: Johnson, Donovan A. and Gerald R. Rising, Guidelines for Teaching Mathematics, Wadsworth Publishing Co., Inc., Belmont, CA, 1967, (pp. 323-346).

2. Suggested reading: Evaluation in Mathematics, National Council of Teachers of Mathematics, Washington, D. C., 1961.

3. In a group discussion with the instructor, the students will modify improperly written test items to fit given objectives.

4. In a group discussion with the instructor, students will suggest test items at various levels of Bloom's Taxonomy. These items will be criticized by the group.

5. Students will be given a short list of objectives at various levels of the taxonomy and will write test items for the objectives. The items will be compared and criticized by the members of the group.

Post-Test

EO 1. Below is a list of behavioral objectives and related test items. Rewrite each item that does not properly measure mastery of the related objective so that it does measure mastery of that objective.

Objective 1. Given the following list of quadrilaterals and a list of definitions of those quadilaterals, the student will match quadrilaterals with definitions without error.

Test Item 1. Match each definition of a figure with the name of that figure. Write the letters in the blanks.

Quadrilaterals

____ 1. square
____ 2. parallelogram
____ 3. kite
____ 4. trapezoid
____ 5. rectangle
____ 6. rhombus

Definitions

a. a quadrilateral with opposite sides parallel
b. a parallelogram with four congruent angles
c. a parallelogram with four congruent sides
d. a parallelogram with four congruent sides and four congruent angles
e. a quadrilateral with exactly one pair of parallel sides
f. a quadrilateral with two pairs of adjacent congruent sides such that the two pairs do not share one side

Objective 2. Given four straight lines in the coordinate plane, one with positive slope, one with negative slope, one with 0 slope, and one with undefined slope, the students will write the slope-intercept equations of the lines with at most one error.

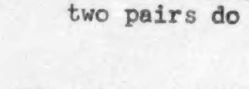
Test Item 2. Graph each of the four equations on the same graph.

1. $y = 3x + 2$
2. $y = -2x + 5$
3. $y = 7$
4. $x = -5$

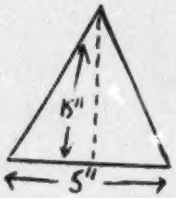
Objective 3. Given the formula for the area of a triangle and the bases and altitudes of four triangles, the student will use the formula to compute the areas with at most one error.

Test Item 3. The formula for the area of a triangle is $A = \frac{1}{2}bh$. Answer each of the following questions.

1. Find the area of this triangle.

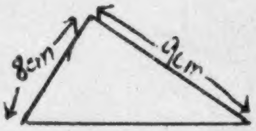


2. Find the area of this isosoceles triangle.



3. The area of a triangle is 20 sq. cm. and the altitude is 40 cm. What is the base?

4. Find the area of this right triangle.



Objective 4. Given three expressions involving numerals and one or two variables and information about the values of the variables (e.g., prime, odd, even, etc.), the student will be able to select from among choices provided those that correctly describe the values of the expressions in at least two of the cases.

Test Item 4. Multiple choice, Loop the letter of the phrase that best answers the question.

1. Suppose that in the following expression the values of a and b are prime numbers greater than 2.

$$\frac{a + b}{2}$$

What is true of the values of $\frac{a + b}{2}$?

a) They are prime.
b) They are odd.
c) They are even.
d) They are integers.
e) None of the above.

2. In the following expressions the values of x are odd and the values of the expression are integers.

$$\frac{x + y}{2}$$

What is true of the values of y?

a) They are odd.
b) They are even.
c) They are multiples of 5.
d) They are composite.
e) None of the above.

3. In the following expression the values of a are multiples of 4.

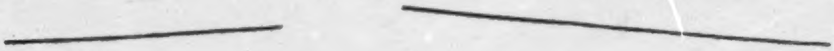
$$\frac{3a}{2}$$

What is true of the values of $\frac{3a}{2}$?

a) They are prime.
b) They are multiples of 4.
c) They are factors of 24.
d) They are integers.
e) None of the above.

Objective 5. Given a straight-edge and compasses construction problem different from those learned in class, the student will devise a procedure for carrying out the construction and describe that procedure in writing. The procedure will be judged correct if it actually produces the required figure without violating any of the usual rules for straight-edge and compasses constructions.

Test Item 5. Using straight-edge and compasses construct a rhombus having its diagonals congruent to these two segments.



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EO 2. Write two test items for each of the following levels of Bloom's Taxonomy.

1. Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation

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TPO 1. Below is a list of objectives - 2 TPOs and 3 EOs. Write appropriate test items for evaluating mastery of each objective.

EO 1. Given three problems each of which consists of an equation of any kind and a number, the student will in each case correctly tell whether or not the given number is a solution of the given equation. Five minutes will be allowed.

EO 2. Given six simple one-step linear equations (i.e., There is only one copy of one variable and only one instance of an operation is involved.), the student will correctly solve at least five of the equations in ten minutes.

EO 3. Given six simple two-step linear equations (only one copy of one variable and one instance of each of two operations), the student will correctly solve at least five of the equations in a ten minute period.

TPO 1. Given any ten linear equations in one variable with at least two copies of the variable on one side of the equations and no copies of the variable on the other side of the equations, the student will be able to correctly solve at least seven of them within a twenty minute period.

TPO 2. Given two undefined operations and their inverses, and two simple one-step equations involving those operations or their inverses, the student will correctly solve both of the equations.

TPO 2 Below are the following:

a set of objectives
a test over those objectives
an answer sheet from a student who took the test

Examine these items and determine which objectives have been mastered. Indicate the objectives that have been mastered by looping their numbers on the following list.

EO 1 EO 2 EO 3 EO 4 EO 5 EO 6 TPO

Behavioral Objectives

EO 1 Given six proportions, two true, two false, and two open, the student will write the corresponding multiplication equations without error.

EO 2 Given six proportions, the student will indicate by writing "T" or "F" whether the proportions are true or false. At most 1 error is allowed.

EO 3 Given nine open proportions, the student will solve at least seven of them correctly.

EO 4 Given six percent equations of the form "a% of b = c" with one unknown, the student will write a correct proportion for each equation.

EO 5 Given six percent equations of the form "a% of b = c" with one unknown, the student will correctly solve at least five of them.

EO 6 Given two percent equations of the form "a% of b = c" with one unknown, the student will write worded problems that fit" the equations. (i.e., The equation is one that could be used to solve the problem.) One of the two must be done correctly.

TPO Given six worded problems with one unknown, the student will correctly solve at least four of them.

Test

EO 1. Write on the answer sheet the corresponding multiplication equation for each proportion.

1. 3/4 = 6/8
2. 5/7 = 10/12
3. 5/x = 15/21
4. 3/4 = 5/$6\frac{2}{3}$
5. 4.1/3.8 = 7.5/28.3
6. a/4.7 = 9/3.1

EO 2. On your answer sheet write "T" if the proportion is true or "F" if the proportion is false.

1. 3/8 = 12/32
2. 5/7 = 10/12
3. 33/22 = 3/11
4. 3/4 = 5/$6\frac{2}{3}$
5. 4.1/3.8 = 7.5/7
6. 3.9/15.4 = 19.9/78.5

EO 3. Solve each proportion. Write your answers on the answer sheet.

1. 5/x = 15/21
2. a/3 = 12/27
3. 9/5 = m/70
4. 4/9 = 32/g
5. 3/5 = 7/r
6. 4/9 = a/17
7. g/100 = 3/5
8. .8/a = 1.7/15
9. 4.3/3.7 = 5.9/r

EO 4. On your answer sheet write a proportion for each equation.

1. 5% of 9 = x
2. 35% of a = 17
3. m% of 16 = 9
4. 175% of y = 44
5. a% of 8 = 41
6. 12% of 6.4 = z

EO 5. Solve each equation. Write your answers on your answer sheet.

1. 8% of 12 = a
2. 15% of g = 4.5
3. r% of 12 = 9
4. g% of 9 = 12
5. 3% of r = 17
6. 120% of 8.4 = m

EO 6. For each equation write a worded problem that fits it. Use the space provided on your answer sheet.

1. 5% of 73 = a 2. m% of 58 = 5.22

TPO. Solve each of the following worded problems. Write your answers on your answer sheet.

1. A motorcycle regularly priced at $500 was on sale at 15% off. What was the sale price?

2. William started working for $2 per hour. After two months he was given a 10% raise. How much was his raise?

3. On her spelling test Marcia spelled 15 out of 18 words correctly. What percent of the words did she spell correctly?

4. The price of a basketball was reduced 25%. The reduced price was $4.50. What was the original price?

5. To get a grade of "A" on a math test the students in Mrs. Smith's class could not miss more than 15% of the items on the test. If one test had 25 questions on it, what was the maximum number of points a student could miss and still get an "A"?

6. The price of one share of stock was $20.50 on April 1. The price of one share of the same stock on June 1 was $27.75. What was the percent of increase of the stock in the two month period?

Answer Sheet Name John B.

EO 1. 1. $3 \times 8 = 4 \times 6$ 2. $5 \times 12 = 7 \times 10$ 3. $5 \times 21 = x \times 15$

4. $3 \times 6\frac{2}{3} = 4 \times 5$ 5. $4.1 \times 28.3 = 38 \times 2.5$ 6. $a \times 3.1 = 4.7 \times 4$

EO 2. 1. T 2. F 3. F

4. T 5. F 6. T

EO 3. 1. 7 2. $1\frac{1}{3}$ 3. 126

4. 72 5. $11\frac{2}{3}$ 6. $7\frac{5}{8}$

7. 60 8. 7 9. 5

EO 4. 1. $\frac{5}{100} = \frac{x}{9}$ 2. $\frac{35}{100} = \frac{17}{a}$ 3. $\frac{m}{100} = \frac{9}{16}$

4. $\frac{175}{100} = \frac{44}{y}$ 5. $\frac{a}{100} = \frac{41}{8}$ 6. $\frac{17}{100} = \frac{z}{6.4}$

EO 5. 1. .96 2. 30 3. 75

4. $133\frac{1}{3}$ 5. 566 6. 10.08

EO 6. 1. A test had 73 points on it. John got 5% of them right. How many John get?

2. A bicycle cost \$58. John had all but \$5.22 of that amount. What percent of the price did John have?

TPO. 1. \$75 2. 20¢ 3. $83\frac{1}{3}$%

4. \$1.16 5. 3 6. 35.4%